

The Iron Age

A CHILTON

PUBLICATION

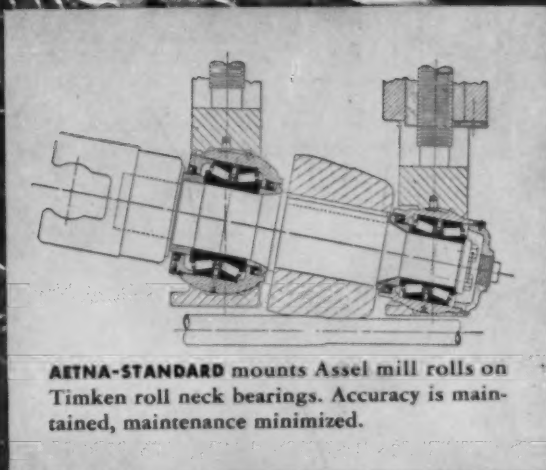
UNIV. OF MICH

NATIONAL METALWORKING WEEKLY

February 12, 1953

FEB 13 1953

EAST ENGINEERING



AETNA-STANDARD mounts Assel mill rolls on Timken roll neck bearings. Accuracy is maintained, maintenance minimized.

Rolls tubing to within one-half standard wall tolerances... with help of TIMKEN® bearings

HEAVY-WALL tubing can be rolled to within one-half standard tolerances on Assel type tube mills, developed by the Timken Company and built by Aetna-Standard. This type of mill is one of the most accurate rolling mills ever built for mechanical tubing.

One big reason for the mill's extreme accuracy is the Timken® tapered roller bearings on the roll necks of the three rolls.

Timken roll neck bearings take radial, thrust and combination loads without special thrust units. Chuck mountings are simpler and more compact. Greater mill rigidity is provided because Timken bearings permit larger diameter roll necks. Load ratings are increased as much as 40%. Roll neck strength is increased 50 to 60%.

Wear within the Timken bearing itself is practically eliminated by true rolling motion and incredibly smooth surface finish. And the lower starting resistance of Timken bearings permits mills to accelerate more rapidly.

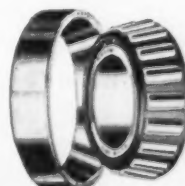
Timken bearings also eliminate complicated lubrication systems, permit the use of simple and economical grease lubrication. No need for pipes or tubes. Rolls can be changed faster.

To get all these advantages in the mill equipment you buy or build, be sure to specify Timken tapered roller bearings. And look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

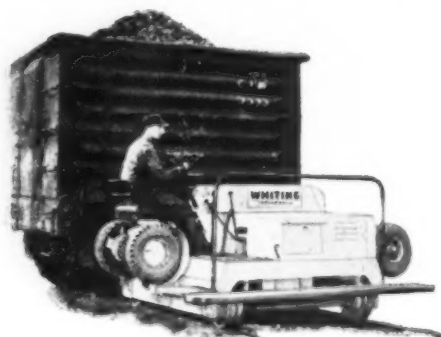


NOT JUST A BALL ● NOT JUST A ROLLER ◯ THE TIMKEN TAPERED ROLLER ◯ BEARING TAKES RADIAL AND THRUST → LOADS OR ANY COMBINATION

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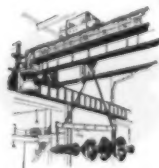
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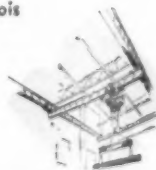
15601 Lathrop Avenue, Harvey, Illinois



Overhead Cranes



Electric Chain Hoists



Trambeam Overhead Handling Systems

Also: AVIATION, FOUNDRY AND RAILROAD EQUIPMENT—SWENSON EQUIPMENT FOR THE PROCESS INDUSTRIES—METAL WORKING MACHINERY

THE IRON AGE

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Editorial

The Iron Age

FOUNDED 1855

Hope Never Ran Higher

"WHAT'S the use?" is dead. "What difference does it make?" is on its way out. A healthy new climate with a positive slant is here. We have always been a people capable of rising to new heights in practical idealism—and making it work. We have also been capable of descending to the depths of confusion and despair.

It all depends upon whether or not we have a leader. There has been a dearth of them for many years. But real leaders beget leaders. They can turn a nation of confused people into a strong positive force. That has happened.

America is a young nation; too young to have gone down the road searching for security for security's sake alone; too young to give up its heritage of action and practicality in exchange for indecision and phony idealism.

President Eisenhower will not satisfy the "rugged individualists" any more than he will satisfy the parlor pinks. He favors no one group above another. His State of the Union talk made that clear.

He has pulled the rug out from under Stalin. For the first time we have taken the initiative in the cold war. The Communists can do the guessing now.

Release of the 7th Fleet worries England and France. It does not worry President Eisenhower or the American people. We have parted with appeasement, indecision and timidity.

At home loyalty and efficiency are to be demanded of government people. But there will be no acquiescence to rumor, gossip or hysterical finger pointing.

We are to balance the budget before we cut taxes. Direct controls have no place in our present economy.

Social gains are to be consolidated. When disaster beyond the control of the citizen overtakes him his government will fight it. Practical and worthwhile services will be retained.

Defense will be provided to the fullest extent necessary—with money spent wisely. This is not cutting defense needs—it is sound and honest preparation for emergencies.

The leadership is here. The signals are simple, the goals are honest and hope for America never ran higher.

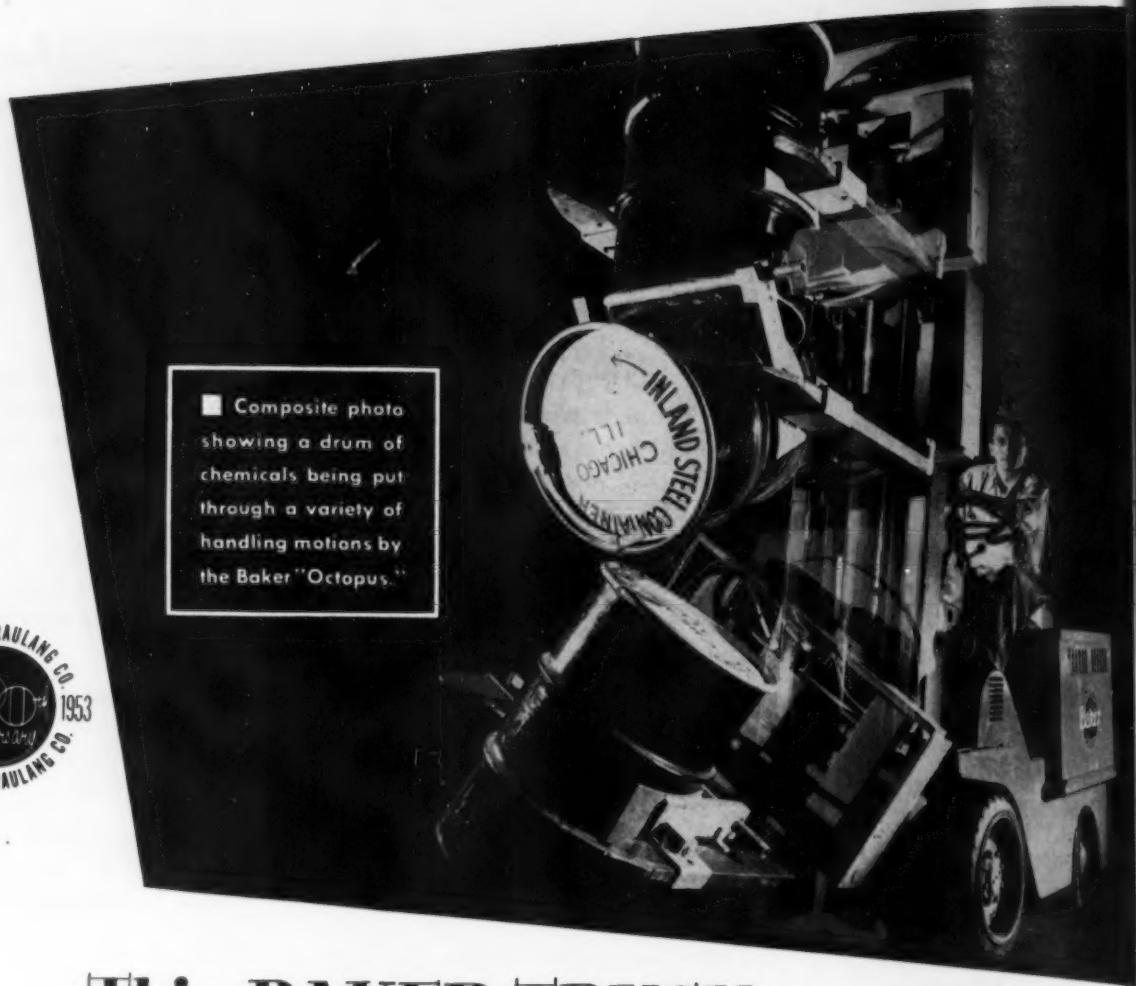
Tom Campbell

Editor

February 12, 1953



■ Composite photo showing a drum of chemicals being put through a variety of handling motions by the Baker "Octopus."



This BAKER TRUCK handles any shape load... *and stacks it in any position!*

■ You name the load—the Baker "Octopus" illustrated will handle it, whether it's a drum, a roll of newsprint, a packing case, a piece of machinery, a bale of cotton or a pallet load of cartons. Moreover, it will pick it up, transport it, raise or lower it, shift it to left or right, revolve it, up-end it, or stack it in any position. In fact, it will handle it with no more physical effort than is needed to operate the simple hydraulic controls.

The "Octopus" consists of a standard Baker Fork Truck equipped with a variety of Baker attachments—360° revolving head, 4-purpose carriage, up-ender, drum clamp, etc.—which may be applied individually or in combinations. While one truck may never be called on to perform all these functions, the "Octopus" demonstrates the range of utility of Baker fork trucks and attachments.

Baker
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write for

6-page special report on the application of Baker attachments to various loads.

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BAKER-LULL Corporation, Subsidiary, Minneapolis, Minn.
Material Handling and Construction Equipment.

Dear Editor:

Letters from readers

Heat Resistance

Sir:
Will you please advise where we may secure more information on the Newsfront item in your Jan. 8 issue stating that low carbon sheet steel can stand plenty of heat when protected by aluminum hydroxide mixed with a mill batch of ground coat enamel.

S. V. READ
Chief Engineer

Buffalo Tank Corp.
Buffalo, N. J.

Write to the U. S. Atomic Energy Commission Depository Library, Princeton University Library, Princeton, N. J. for the report "Coatings for the Protection of Low Carbon Steel at Elevated Temperatures" by J. H. Handwerk and T. N. McVay.—Ed.

New Stainless

Sir:
We have read with interest the article on new stainless steel, p. 228 of the Jan. 1 issue.

Would you kindly furnish us with any additional information available on the subject.

E. L. FULLER
General Supervisor of
Materials Research

International Harvester Co.
Chicago

An article on the forming and welding characteristics of manganese chrome stainless steel will be published Mar. 12.—Ed.

Transposition

Sir:
I thought you would like to know that a typographical error appeared on p. 100 of your Jan. 8 issue. I refer to table No. 1 which lists the 35,000-ton closed die forging press being built for Kaiser Aluminum & Chemical Co. by the Baldwin-Lima-Hamilton Co.

This press, of course, is actually being built by the E. W. Bliss Co. at Canton, Ohio. You did give us credit for this press on the table reproduced on p. 85 of your Apr. 3 issue.

J. T. HARRINGTON
Advertising Manager

E. W. Bliss Co.
Canton, Ohio

Yes, the line was transposed.—Ed.

Welding Beryllium Copper

Sir:
On p. 35 of your Jan. 15 issue you have indicated that beryllium copper is being successfully welded for the first time with a condenser discharge type resistance welder. The statement implies that beryllium copper cannot be successfully welded on account of the 700°F heat treating temperature.

This, of course, is not the case since

beryllium copper has been successfully welded for a number of years by carbon arc, metal arc and inert arc welding procedures. The usual practice calls for age hardening following joining.

Since we are not familiar with the type of equipment mentioned in your note, we would appreciate additional information regarding manufacture, etc.

J. T. RICHARDS
Development Engineer

The Beryllium Corp.
Reading, Pa.

What we meant to imply was that neither the mechanical or electrical properties of Berylco 25 are affected by this type of welding. Therefore, no post welding treatment is needed. This job is being done by the Whiting & Davis Co., Plainville, Mass., who are using a Raytheon condenser-discharger type of welder.—Ed.

Free List

Sir:

An item in your Jan. 15 issue says that a bill is now before the House Ways and Means Committee to remove the tariff duty on bauxite.

We have not been able to locate any reference to this bill from other sources. Can you supply us with the bill number and the name of the congressman who introduced it?

A. C. NEWTON
Executive Secretary

The Refractories Institute
Pittsburgh

Rep. Hale Boggs, D. of La., introduced the bill (H.R. 222) on Jan. 3.—Ed.

Chip Engineering

Sir:

We read with interest the article "Chip Engineering Vital Counterpart to Automated Machining Lines," Dec. 18, 1952, p. 142, dealing with the chip handling system at the Ford-Cleveland engine plant.

The first sentence of the second paragraph of the second column, p. 142, reads as follows: "At the new engine plant, oscillating conveyers are used exclusively for conveying dry chips." We feel that this is an incorrect statement as there are five Hapman tubular conveyers being used in conjunction with this system to convey the dry chips from the Cincinnati broaches into the oscillating conveyers.

We feel that you would be interested to know that our equipment is a definite component part of this conveying system.

W. E. HARPER
Sales Manager

Hapman Conveyors, Inc.
Kalamazoo, Mich.

They worked so smoothly we overlooked them.—Ed.

PRIME MOVER of INVENTORIES



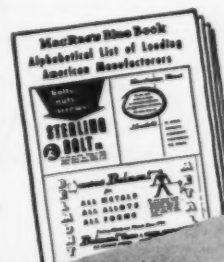
Just Ahead . . .

An Important Milestone

The 1953—60th Annual—Edition of MacRae's Blue Book will appear this spring with the names and addresses of 50,000 important plants listed under more than 45,000 classifications. Trade marks and other pertinent information are included.

Write for suggestions concerning the valuable uses of this Directory of American Industry.

This handy address directory, at left, sent free to all recipients of the current edition of MacRae's Blue Book, has been received with enthusiasm.



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single copy costs and
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Experienced men and modern tools
make Finkl steels the finest

Whether it's 35 tons of special alloy analysis or a quality carbon heat, the experience of steel men like Dave, Bruce, Roy, Lennie, and Chick plus modern tools such as the new electric furnaces shown above combine to make Finkl steels the finest available.

Each heat is constantly checked and carefully controlled, for here is where Finkl quality begins. Here is where we start proving that the finest product is the least expensive to you in the long run.

Since 1879, Finkl has developed many special analysis steels of their own through the desire to constantly improve and to produce the finest die blocks and forgings at the lowest cost to you.



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ELECTRIC FURNACE STEELS • DIE BLOCKS • FORGINGS

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Fatigue Cracks

Chain of Command

Four years ago Editor-in-chief Tom Campbell went to the far north country to inspect the new Quebec-Labrador deposit of iron ore and won \$9 in a poker game. He came back predicting that this deposit offered vast opportunities for development and would make a lot of pessimists say "uncle" *THE IRON AGE*, Nov. 4, 1948). This year he went back, saw the project was flourishing, confirmed his prediction and won \$9.25 in a poker game. This was all written up in our January 8th issue—truly an inspiring story of pioneering hardships and big men doing big things. A part of his latest journey took him and a few others over the railroad construction project in a DC-3. Flying at 500 feet they zipped over what is commonly called a plug—a spot that has to be dynamited to level out the bed — and were quite thrilled at the friendly waves of the gang working below. Actually the waves were more frantic than friendly (it later developed they were waving goodbye) for the gang has just touched off a large charge of dynamite. The explosion went off, rocks looked like flak, the plane wavered but snaked through. That's how we nearly lost Tom. All this, of course, is not important except for the fact that outside of Managing Editor George Sullivan, Jug Brown, Bill Packard, a 40-odd assortment of associates, assistants and correspondents, Mildred, the receptionist, and 700 plus or minus people in the Chilton Philadelphia Headquarters, plus all families and friends we're next in line for the job of Editor, chief.

Fashion is Bulldozers

Our non-ferrous metals man, Bob Hatchesek, just handed us a rather surprising piece from the Kaiser Aluminum News. It's a story about the "Standard Rate and Data Service, the Ad Man's Bible" (a publication that lists circulation statistics and advertising rates for magazines and newspapers). It leads off with "Advertising to be successful, first must reach those persons most likely to buy the product. That's why bulldozers aren't advertised in the *Woman's Home Companion* nor the latest Dior fashions in *Iron Age*." Now let's get this straight. As America's favorite family journal (your ffj) for 98 years, *THE IRON AGE* takes a back seat to no magazine on the extent of its family readership.

by William M. Coffey

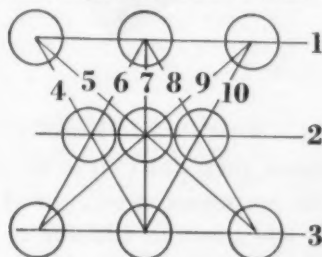
We cherchez plenty of femmes and children, too. Witness this letter from Billy Wells, age 13, Freeport, L. I.: "Our Boy Scout troop, Platytypus Patrol, would like 20 reprints of your article, "Silicon Carbide Deoxidation Practice Grows." And this letter from Mrs. Harvey Kitchner, Cleveland: "It's simply a mad rush every week between my husband, Grandma Kitchner and baby Harvey, Jr. when the postman proudly yells from way down the street, 'Here's your Iron Age!' I think your latest in cold rolled strip is out of this world, so yar." We'll take all the Dior 'ya got.

Puzzlers

We promised last week a round-up of winners and puzzle answers. Here goes:

What's the age of the ship and its boiler? *Answer:* Ship 24, Boiler, 18. And the winners: Fred Wetzler, Miss Gloria Szymczak, H. L. Millar, Charles O. Talberg, John D. Statler, Jay W. Fredrickson, H. C. Myers, Jr., J. Wade Rice, C. Stewart Anthony, Lewis D. Rice, Harold Johns, D. S. Tarr, J. W. Algeo, R. W. Hautzenroeder, William E. McCord, F. Rondepierre and W. Trinks.

How do you arrange nine coins in ten rows of three each? *Answer:*



... and the winners: Robert Pia-secki, V. J. Condon, R. Hauser, R. W. Hautzenroeder, F. Rondepierre, Kenneth H. Koehler and Barbara A. Schelberg, H. J. Zorn, F. J. Foersterling, F. W. Ihle, E. Buschow and Lewis D. Rice.

Some new arrivals to the "nearby town" problem: Donald L. De Arment, George F. Weber, George F. Kiesel, Jr., William H. Berg, T. H. Messer and Frank C. Berger. Next week the beef puzzle winners.

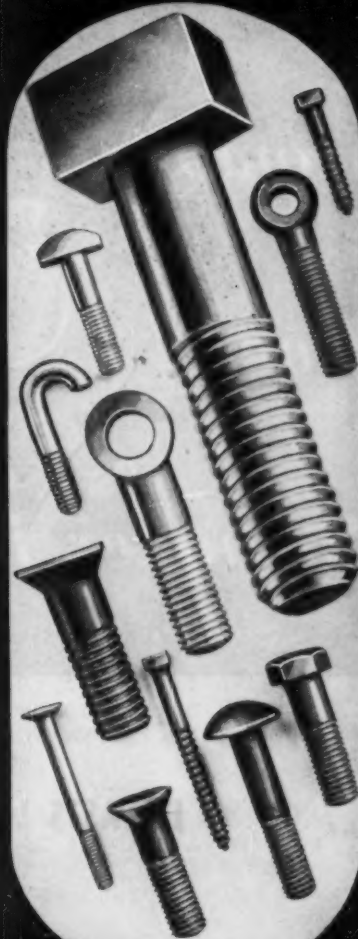
New Puzzle

A square lake with a tree growing on the shore at each corner. Problem: Double the area of the lake, keeping its square without moving the trees or leaving them on islands. Score yourself 100% if answer is found in five second.

THREADED SPECIALTIES

TEE BOLTS

by an exclusive method



Among Pawtucket's many specialty products, these lower-cost tee-head bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket tee-head bolts are made in standard sizes 1/4" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit, if required.

BETTER BOLTS SINCE 1882

PAWTUCKET

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THE PLACE TO SOLVE YOUR BOLT PROBLEMS

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IT LASTS LONGER . . .

That's why Homoflex Hose saves you money. Workmen like it because they don't have to "fight" it. It's light, flexible, easy to handle, with no pre-set twist . . . and very strong for handling air, water, other fluids and gases. In addition to all this, R/M engineers found a way to make the parts of Homoflex Hose inseparable—adding still more to the life of the hose. If you want to lower your hose costs just raise your standards to Homoflex . . . Ask the R/M Distributor for Bulletin 6879. He'll tell you about other R/M hose types for steam, oil, suction, chemicals . . . also how you get MORE USE PER DOLLAR with R/M transmission, and conveyor belt and V-belts.



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THE IRON AGE Newsfront

A CONTINUOUS PROCESS for cleaning, phosphate coating and enameling of steel strip has been developed by a major fabricator. As many as six coils can be processed at one time.

SEPARATING STAINLESS STEEL BY SPARK TESTING still defies positive solution. Latest approach involves development of special goggle lenses to accentuate predominating color in the spark stream. Results still leave much to be desired.

IMPROVED ECONOMY OF OPERATION is not the only reason V-8 engines are popular. In addition to 8 pct improvement in fuel consumption, estimated production costs of the new Buick V-8 will be 7 pct less than its old in-line engine. One half of the savings is due to weight.

U. S. INVESTMENT ABROAD is likely to receive additional encouragement from the government. Idea is that U. S. dollars invested abroad would fit in well with the "trade, not aid" campaign. Government may resort to special tax treatment to create a more favorable climate.

COLD FORMING EQUIPMENT is being adapted for cold rolling of splines on shaft ends to replace hobbing methods. It's still experimental. If proven practical, closer tolerances, better grain structure in the steel and elimination of several operations now required by hobbing may be possible.

AUTOMATION APPLIED TO METAL PROCESSING may be reaching the limit of possibilities, some experts think. Now more attention is being given to automation of assembly operations, particularly small parts. Much progress has already been made.

MAKING ALUMINUM BY DISSOLVING silico-aluminum in liquid zinc at 1200° F is in pilot plant operation in France. Zinc is distilled from aluminum, yielding a high purity metal. Price of kaolin and white bauxite will determine economies of the Loerenstein process.

USE OF ENAMELING STOCK IN PRODUCTION OF TV TUBES is moving ahead. One manufacturer hopes to get into limited production soon. Steel to be used is cold-rolled 0.03 C max. Normal enameling techniques would be used. Most metal-glass tubes now use stainless steel.

ECONOMISTS MAY BE A DIME A DOZEN when the new Administration gets through some planned housecleaning. Agriculture Dept. has 2500, most of whom will get the ax. Commerce has 1000. Some congressmen feel 25 would do. Treasury with 70, could limp along on 10.

MANUFACTURE OF IMPACT STAMPED aluminum small arms cartridges is through the production line stage. It is predicted the cartridges will find ready acceptance in commercial applications.

POSSIBILITIES OF A MILL-PRODUCED WAX-COATED STEEL SHEET for use in drawing or stamping applications are being considered by some fabricators. Waxes, applied immediately after rolling, would not deteriorate with storage, would give the raw sheet corrosion and damage protection, and serve as a drawing compound.



BIG Magnet *Pays Off* with BIG Lifts

TYPE SW ALL-WELDED LIFTING MAGNET HAS THESE IMPROVEMENTS

- 1 Leads protected at magnet-end.
- 2 If damaged, outer leads replaceable without entering terminal-boxes.
- 3 Solderless clasp-type connectors.
- 4 Stronger welds — 2 to 5 times stronger.
- 5 ECAMICA board (new EC&M development) insulates coil layers.
- 6 New, purer asbestos, strengthened by EC&M No. 281 impregnation, insulates between turns.
- 7 Coil windings locked against movement.
- 8 Thicker pole shoes with high shoulders.
- 9 Stronger manganese bottom plate.
- 10 Two terminal chambers — coil-leads on outside of coil.

"Best Magnet We Ever Had—and We've Had Lots of 'Em!" That's what Abe Knofsky, Warren Scrap Iron and Metal Co. of Warren, Ohio, says . . . also, "Its greater lifting capacity means *quicker lifting* and *lower cost per carload*."

This company uses a 55-inch Type SW Magnet, on a 30-ton Browning Crane and Shovel Type ML-300 Crane with 60-foot boom, for loading various kinds of scrap into railroad cars.

EC&M Improved Design Type SW ALL WELDED Magnets give greater lifting capacity per dollar invested.

IT WILL PAY YOU TO INVESTIGATE THEM

ASK FOR NEW BULLETIN

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THE ELECTRIC CONTROLLER & MFG. CO.

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STEEL: How the Trend Will Go on Prices

Lifting of controls challenges statesmanship of industry leaders . . . Some price increases should be expected . . . But no rush is seen . . . Expect union wage bid—By J. B. Delaney.

Lifting of price controls will challenge statesmanship of the steel industry.

Industry leaders have no intention of fumbling the ball.

Some price increases are inevitable. They will not come overnight except from a few small, marginal producers whose costs are high. Industry-wide advances, when they come, will be selective. Adjustments will be based on cost of production plus a reasonable margin of profit.

The industry will use the opportunity to restore a balanced price relationship between products. This balance has become somewhat distorted due to across-the-board OPS increases.

Traffic Would Bear Boost

On the basis of current market conditions, steel producers could hike prices almost at will with the lifting of controls and get away with it. Steel-hungry consumers are paying conversion prices double and triple regular mill prices for hard-to-get products. Marginal producers boast substantial backlogs despite prices well above the bulk of the field.

But there are good reasons why a general upward adjustment in prices is not likely to materialize quickly. First is the probability of adverse public reaction to precipitate advances. Second, the industry is likely to lean over backward to avoid embarrassing the first "friendly" national Administration in two decades. Third is steel labor. The industry has one eye cocked on expected demands for higher wages this summer.

The industry knows it will be on the spot. No price advances will be made without economic facts to back them up.

Industry leaders have made no



WAGE TALKS of U. S. Steel's Benjamin Fairless and United Steelworkers' David J. McDonald will influence steel prices. Mr. McDonald will seek wage boosts.

secret of their contention that the average increase of \$5.20 per ton allowed after last summer's strike was not enough to cover increased costs. Costs have increased considerably since then.

While the steel strike was largely responsible for a decline in steel earnings last year, the industry points to 1951 when there was no strike as proof that high taxes and costs have hurt profits. Compared with 1950, industry earnings in 1951 were off 13 pct. U. S. Steel Corp. reported net income pct of sales as 5.2 in 1951 compared with 7.3 in 1950. A further decline to 4.6 pct was reported last year.

One company chairman, who

predicted increases within reasonable limits, likened the situation to the man whose house is on fire—"He's a fool if he doesn't do something about it."

Discussions thus far have centered about base price changes. Little is heard about revision of extra charges.

The possibility of increased la-



bor costs is important to the price picture. The United Steelworkers of America are free to ask for reopening of the contract on wages anytime after May 1. If no agreement is reached by June 30, the union may strike.

It's a foregone conclusion that David J. McDonald, the union's new president, will demand a wage increase. He is expected to drive a hard bargain even to the point of threatening a strike. But the betting is for a settlement without a walkout. If Mr. McDonald gets an increase it will be nothing like last year's concessions, which averaged 25¢ an hr.

Despite speculation that Mr. McDonald might be tougher than

CONTROLS: Wage Lid Out the Window

Like orders wage ceilings off immediately . . . Price controls to follow "in orderly manner" . . . Some wage hikes effective immediately . . . See some price rises—By A. K. Rannells.

There's a loud hum of activity this week along the control front in Washington following a presidential order scrapping wage controls immediately and directing pricing decontrol as quickly as possible.

One thing now clear to controls officials, despite some indecision as to procedures, is that there must be nothing left to discard by Apr. 30 except the text of the price-wage law itself.

Clean the Slate

Indications are that the White House wants no further legislation in this field, not even the standby controls which had been urged so strongly by the outgoing Administration.

If free enterprise and the indirect controls available to the government can't keep the situation in hand, says the White House, then would be the time to "promptly ask the Congress for such legislation as may be required."

Wage controls were suspended, effective immediately, by White House direction following a 2-hr meeting Friday with the Cabinet. Processing of wage adjustment applications had been stopped earlier in the week.

Specifically, the executive order suspends all wage and salary regulations and orders issued or administered by the Wage Stabiliza-

tion Board (or Wage Stabilization Committee), the Salary Stabilization Board (or Office of Salary

Lift Price Controls on These:

Wet Ground Mica
Industrial Steel Wool
Fullers' Earth
Graphite Crucibles
Custom-Built Cars
Modified Cars
Foreign-Built Cars
Used Cars (Pre-1946 models)
Small Appliances
All Furniture, including Metal
Sporting Goods
Bicycles & Accessories
Toys
Clocks
Musical Instruments
Radio, Television Sets & Parts
Silverware
Cutlery
All Housewares covered in Appendix B of CPR 7

Stabilization), and the Railroad and Airline Wage Board.

In addition, it was made clear that all pay adjustments, including retroactive agreements, which had been applied for but which were still pending before these agencies could now go into effect at once.

It was also made plain that penalty provisions for past alleged violations still are in force—but that adjustments subsequent to

the Friday order are free of such restraint.

Stepped-up activity also was noticeable in the price control offices. Instructions were clearer: The White House message called for lifting of remaining price controls "in an orderly manner" and agency termination by Apr. 30.

However, a big question was whether decontrol should be on a sudden and wholesale basis. Apparently this was settled by the pricing agency, which this week was following a middle course of dropping some ceiling prices.

First batch of decontrol orders would be in a general overriding form, officials said. These would cover most of the products remaining under CPR 7 (retail regulation) such as wood and metal furniture, small appliances containing metal, and textiles, and other soft goods.

No Rush on Some

There would be no rush to include heavy machinery, new cars, and most types of heavy metal-containing goods in early decontrol action, learned IRON AGE.

New car ceilings in general were not to be lifted at once. However, all pre-1946 models of used cars, all custom built cars, and foreign made vehicles were scheduled for immediate decontrol.

Officials said this would remove price lids on nearly 18 million used cars but would have little effect on new output since the amount of custom and foreign built cars is relatively small.

As it stood early this week, the last items scheduled for decontrol included those products at or

Special Report

Continued

his predecessor, the late Philip Murray, labor relations people are not too worried. They believe he will not risk another strike of workers who have not fully recovered financially from last year's walkout. Average pay loss per worker in the 1952 strike was \$650. On the basis of a 40-hr week the steel workers won't have their

losses made up until next fall.

Also, the union will be strictly on its own this year. It cannot look to a sympathetic Washington. President Eisenhower has indicated neither industry nor labor can expect to gain anything by appealing to the capital.

Even some union leaders are said to feel that Mr. McDonald

does not have to outdo himself to consolidate his position as leader of the USW. They point out that Mr. Murray last year was forced to settle without the union shop—the one issue that delayed agreement for weeks after the industry offered substantially the same economic terms as finally agreed upon.

Machinery

pushing against the ceiling. On the tentative list scheduled for delayed decontrol were the basic metals—steel, copper, aluminum.

Nor were the below-ceiling lead and zinc included in the hastily drawn up first list, although no reason was given for the omission.

Save Price Wage Records

One overriding fact stands out in the commotion arising from the price decontrol activity. Industry and business must not overlook the fact that all company records pertaining to price-wage controls must be preserved.

Washington's authority to institute suits alleging over-ceiling charges or payments will remain in effect. Some federal courts even now are still concerned with litigation growing out of alleged violations stemming from World War II controls.

A maximum of 2 years of preservation should suffice in most cases.

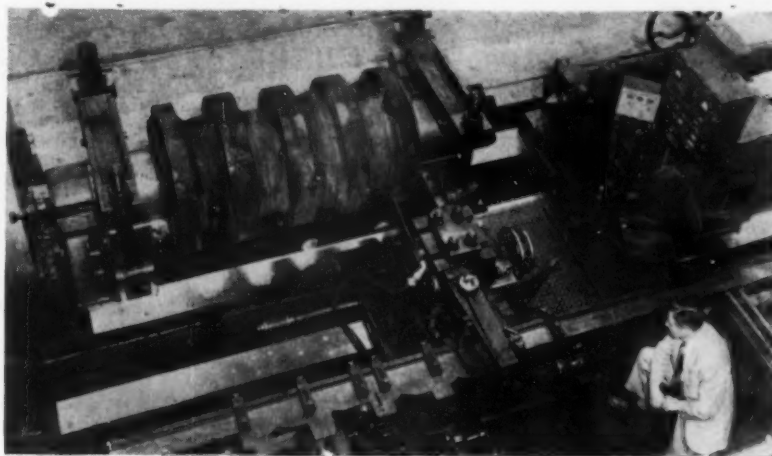
Government stabilization officials have modified their thinking to some extent. They do not now foresee any appreciable general price rise, contrary to thoughts a month ago.

"Some Increases Coming"

However, they say that there will obviously be some price increases here and there. They add that such increases after all goods are decontrolled could cost the consuming public between \$500 million and \$1 billion over the ensuing 12 months.

With respect to production controls, neither was the picture clear this week nor the problem immediately pressing. There seemed no doubt that allocation control would have to be retained over a few critical materials, such as nickel, after June 30. Also military priorities are to continue in effect.

Last week, an executive order merged Defense Production Administration with the Office of Defense Mobilization, which also swallowed up National Security Resources Board.



TOOL HOLDER'S long, narrow design enables deep groove cutting.

Lathe Turns Rolls Automatically

For the first time on a machine of its size, all electronic controls guide the cutter of a 60-in. roll turning lathe newly installed at U. S. Steel Corp.'s Homestead Works. The machine represents fully-automatic contour duplication—long the aim of engineers.

It's also the first time a lathe of this sort is used to generate the outlines for producing structural shapes and such rolled steel items on the huge mill rolls.

Control versatility and ease of maintaining the electronic duplicating equipment are other advantages claimed. Pushbutton controls permit rapid roughing and finishing cuts.

Duplication is accomplished by a stylus which follows the contour of a flat template of the desired shape. Deflection of the tracer is electronically amplified, interpreted and fed to the two electric motors. Tool bit and stylus are on the same carriage.

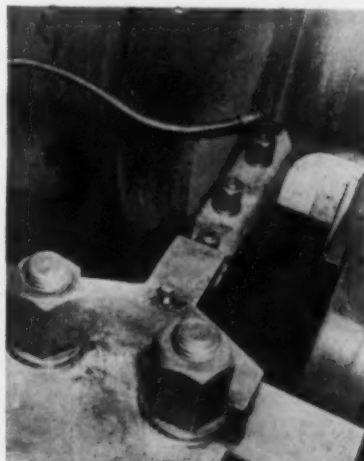
Actual roll turning is quite rapid since worker supervision of the machine is minimized. Two roll turning jobs have been speeded from 156 hr to 49 hr and from 196 hr to 49 hr, with a metal removal rate 2 to 6 times as much as a standard lathe.

Mackintosh-Hemphill Co., designer and builder of the lathe, anticipates considerable savings to result from use of this machine.

The lathe can take rolls up to 35 tons in weight, with diameters as large as 54 in. and lengths to 20 ft. Spindle will turn up to 32 rpm and surface speeds of 60 fpm on iron and 200 fpm on steel are recommended with carbide bits.

The lathe itself is no mid-get, measuring 45 ft long. Face plate has a 5-ft diameter, the headstock length is 9 ft, and carriage length on the bed is 6 ft. Bed itself measures 65 in. wide. Motor is rated at 75 hp.

Even chip disposal is handled automatically. A continuous conveyor drops scraps into buckets placed in pits at the end of the bed.



CAST STEEL shape roll is mounted in neck rests for automatic turning.

EARTHMOVERS: '53 Should Be Solid

Construction machinery builders look for good sales this year . . . Expect heavy building activity . . . Delivery time improves . . . Raw materials easier to get—By K. W. Bennett.

With airfield, dam, and turnpike appropriations offering promise for the construction equipment market, construction machinery builders are counting on a good year in 1953.

There is a strong sentiment that the lush days of the early '50s are past, but that business will be at a solid level for the coming year.

Resume Stalled Project?

Competition, always keen, is setting a swifter pace. Backlogs of equipment on order have been shrinking. But construction men are finally able to coax some badly needed concrete reinforcing bars out of hiding and structurals are expected to become more easily obtainable. This should mean a resumption of building projects that were pinched off by the steel shortage.

A year ago, large construction equipment firms were reporting backlogs of 10 and 12 months. Canadian distributors complained that delivery from the states might take a year, that even spare parts were extremely scarce.

This month, backlogs of 4 to 6 months were common. Pieces of heavy equipment were available for immediate delivery, including heavy trucks, mixer trucks, pumps, even blades.

Deliveries Shortened

Though backlogs of as much as 12 months are reported, it is possible to get equipment in a much shorter period. "Backlog" may include equipment originally ordered for spring delivery, 3 months from today.

New buyers, asking for shorter delivery, may get it by specifying a nearer date. And customers are demanding quick delivery or taking their business elsewhere.

One firm offers "off the floor delivery" of heavy equipment; an-

other can arrange "immediate" delivery. Still another has heavy equipment for "delivery in 60 days." Light equipment is available on short delivery.

Easing is due more to freer raw materials than a falloff in demand. Suppliers reported that plate, while

Officers Elected

Members of the Associated Equipment Distributors last week in Chicago elected John Oechsle, Metalweld Inc., Philadelphia, new president of the construction machinery wholesalers organization. Frank Skidmore, Contractors Equipment & Supply Co., Albuquerque, N. M., was chosen executive vice-president. Other vice-presidents were George W. Gagel, Machinery & Supplies Co., Kansas City; Ray J. Finn, Bode-Finn Co., Cincinnati; J. W. Halls, Consolidated Engines & Machinery Co. Ltd., Montreal. F. J. Fitzpatrick, Parker-Danner Co., Hyde Park, Mass., was elected treasurer.

requiring some scrambling, was not interfering with delivery. Structurals and angles are offering considerable difficulty.

Manufacturers are still doing a high percentage of warehouse buying, are cutting purchases of foreign and conversion steel. Prices are increasingly competitive.

Profits Cut

Substitutions in plate and structurals are still being made. Equipment lines that employ less of this type of steel are being pushed. Some firms have dropped equipment lines, will restore them when the steel products they need are more plentiful.

And in a few equipment lines,

profits are being cut to keep the equipment on the market, even though the high priced steel it contains has cut profit margins to the nub. Competition is sharp enough to make the move worth while.

Will Market Slump

There are reports of a December dropoff in sales volume that exceeds the regular seasonal slump. Other reports of the same slump place it back at the beginning of fourth quarter. This is partly due to the tightening of steel for construction and oil country development after the steel strike.

Easing in heavy equipment is important. Heavy pieces have been consistently harder to get than light equipment since the end of World War II. For the construction man, it means fewer growing pains when tackling a large construction award. For the Canadians, it means help in items that have been critical for several years.

Gets Atomic Energy Contract

Grinnell Corp., of Providence, R. I., will handle mechanical construction at the new Pike County, Ohio atomic energy plant under terms of a subcontract valued at about \$230 million.

Award of the subcontract was made by Peter Kiewit Sons' Co., builders of the \$1.2 billion facility.

Called for in the subcontract are construction of process and auxiliary piping, instrumentation, equipment installation, testing, and related work.

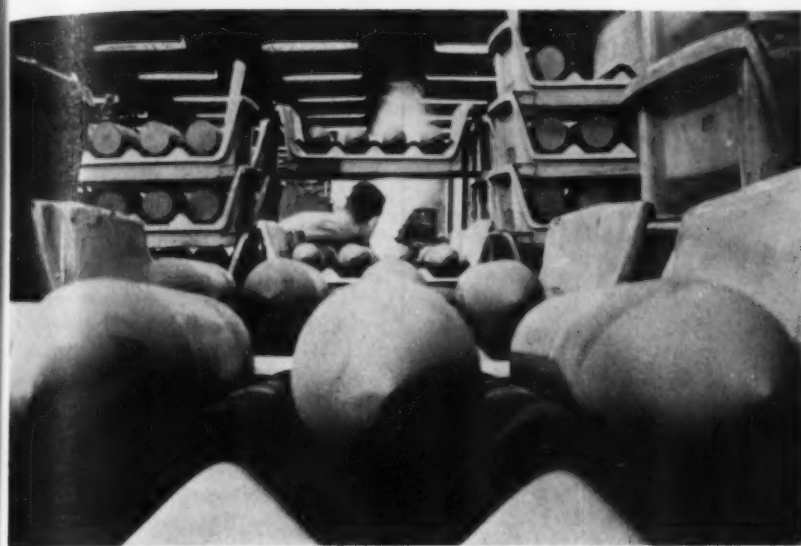
Water System Approvals Totalled

Government approval of water and sewage system construction during fourth quarter 1952

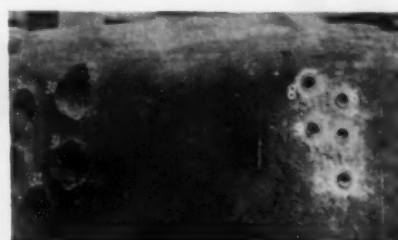
Construction Steel Inquiries and Awards appear on p. 84.

amounted to 463 projects involving a total cost of \$125 million.

Controlled materials allotments in connection with these programs added up to 123,635 tons of steel, 1088.5 tons of copper and 60 tons of aluminum, National Production Authority reports.



TUNGSTEN CARBIDE CORES . . . Stacks waiting for final heat treating.



PUNCH . . . Effect of carbide cored shells on tank turret (above) and armor plate.

Anti-Tank Shell Developed in 2 Weeks

Anti-tank shells with tungsten carbide cores are knocking out Red tanks in Korea. They had their first hasty workout in World War II.

The adaptation of this cutting tool material to shell construction has a dramatic history.

At Carboloy Dept. of General Electric, where they were first developed, the cores are produced from tungsten carbide powder.

But it wasn't always that way. The formerly classified story of their development was just told by Brig. Gen. Paul M. Seleen, Detroit Ordnance commander. Swift compliance to an emergency request is credited with stopping German Tiger tanks at St. Lo in 1944.

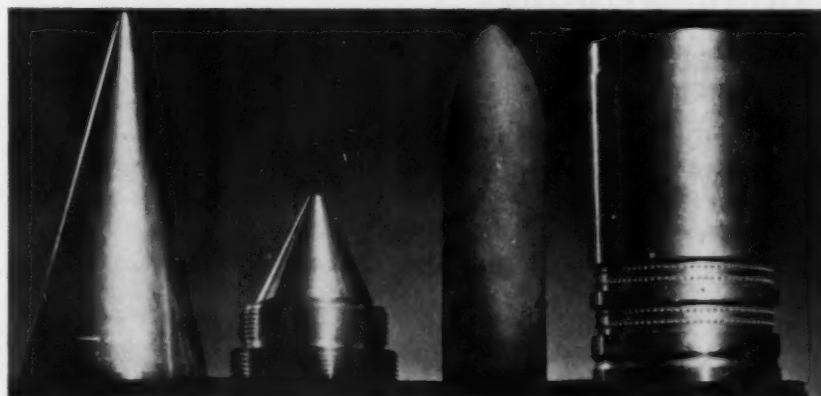
A new anti-tank shell wasn't ready when the order was flashed. In Detroit, Ordnance had worked with Carboloy on cutting tools and Carboloy had supplied tungsten carbide for development work. Could carbide cores be made immediately, Ordnance asked.

Within 2 days ten cores were ready for test firing. Less than a week after the production order, tests showed the cores would penetrate the thickest tank armor.

But production capacity was non-existent. A grinder was flown in. A storage shed was cleared. Machines loaded for overseas were unloaded. A special sintering furnace was built in 19 hr. Output started in less than 2 weeks.



STEP ONE . . . Weighing powder prior to compacting it in mold at left.

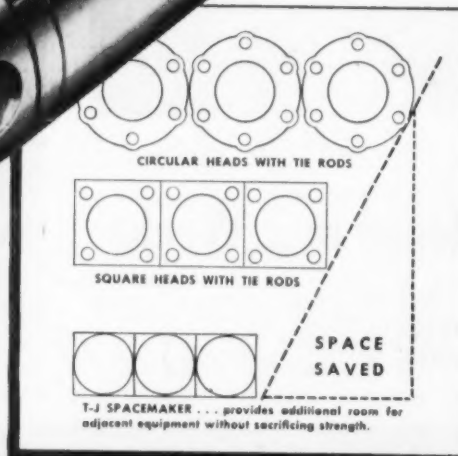


SHELL PARTS . . . (left to right) Windshield, nose piece, core and shell body showing grooves for rotating bands.

NEW **(T-J)** Spacemaker AIR CYLINDERS



- SAVES UP TO 40% SPACE WITH NEW STREAMLINED DESIGN.
- SUPER STRENGTH . . . EXTRA HIGH SAFETY FACTOR.
- SOLID STEEL HEADS.
- HEAVY WALL, PRECISION HONED, HARD CHROME PLATED SEAMLESS STEEL BODY.
- LEAKPROOF CYLINDER HEAD TO BODY CONSTRUCTION.
- RELATIVE PORT POSITIONS MAY BE ROTATED WITHOUT DISASSEMBLY OF CYLINDER AND LOCKED IN DESIRED POSITION.
- HEAVY DUTY, HI-TENSILE, HARD CHROME PLATED PISTON ROD.



Streamlined construction of the new T-J Cylinders eliminates tie rods . . . reduces head size . . . and saves up to 40% in mounting space! In addition, a new high in strength is achieved with solid steel heads and heavy wall seamless steel body . . . leakproof construction . . . extra high safety factor.

Cylinder walls are precision honed and hard chrome plated for long-life efficiency. Available with the new T-J Super Cushion Flexible Seals which insure positive cushion with automatic valve action for fast return stroke. Many standard sizes and styles . . . both cushioned and non-cushioned . . . for wide range of pushing, pulling, lifting, clamping or control jobs. T-J dependability. Fast delivery to meet rush requirements. Write for bulletin 8152. The Tomkins-Johnson Co., Jackson, Mich.

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EXPERIENCE**

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PNEUMATIC, AIR AND HYDRAULIC CYLINDERS, CUTTERS, CLIMBERS

Metallurgy

JETS:

New metals needed for better performance at higher temperatures.

It is becoming clear that metallurgists may hold the key to improved jet engine performance as designers press for higher and higher operating temperatures.

This was pointed out in Detroit last week by R. B. Johnson, plant laboratory engineer at General Electric's Gas Turbine Div. He outlined some of these metallurgical problems in jet engine construction at a joint meeting of Aeronautic and Engineering Materials sections of the Society of Automotive Engineers.

"Compromise"

Mr. Johnson said designers would like to have jet engine parts operate at temperatures of 3500°F. But because materials are not available to carry high stresses of these temperatures, "the successful performance of the jet engine becomes a compromise between material, design, availability and cost."

In the compressor chamber, magnesium and aluminum appear to be at a draw. Aluminum has strength advantages, but magnesium is lighter. New alloys are needed to improve the potential value of both.

Ceramic Coated

In the combustion chamber, ceramic coatings are being used on the metal liner and, Mr. Johnson believes, ceramics will be used to greater future advantage.

As the jet engine designer pushes on for higher temperatures, either new alloys or air cooling systems must be developed. Fuel has been tried as a coolant, giving a desired pre-heating to the fuel, and even molten metals are being investigated for this purpose. And cooling systems are not only hard to build but cut engine efficiency.

"The faster we fly the hotter it gets and thus the metallurgist has one of the keys to a successful trip to the moon," is his conclusion.

BLAST FURNACE: Test Carbon Lining

U. S. Steel test of carbon lining at Gary mill may find limit of its use . . . Users of carbon claim several advantages . . . Market could expand if test's satisfactory—By J. B. Delaney.

How to get more pig iron out of the same blast furnace more efficiently is a problem that has often followed steel industry engineers to sleep. The interest of many of these men is now centered on a U. S. Steel Co. experiment at its Gary, Ind., mill.

There a blast furnace is being lined to a point of 35 ft above the mantle, including the bosh. The lining is carbon. Before 1945 carbon was hardly used at all and today over 100 furnace stacks are lined or patched with carbon. This is 40 pct of the nation's 245 iron producing furnaces.

Find Limits of Use

U. S. Steel engineers want to find out the limit of its use. (Oxidizing conditions won't permit use of carbon near the top of the furnace.)

Users of carbon linings report several advantages. Among these are good heat transfer qualities, better insurance against furnace breakouts (or ruptures). Also claimed is smoother operation and faster blow-in.

National Carbon Co. reports that 42 furnaces with carbon linings have each produced over 1 million tons of iron.

Of these 42 blast furnaces, 12 have produced over 2 million tons each.

Limitations and Advantages

From this experience furnace men have reached some conclusions. Carbon lining has its limitations as well as its advantages. Some producers feel that carbon across the hearth pad doesn't have a long enough life span.

Another occasional trouble spot for carbon lining is caused around the iron notch of the furnace. Yet pushers of carbon lining say there are two sides even to these objections.

It now seems carbon lining has worked satisfactorily in the crucible and tuyere zone of the furnaces—and through the tuyere zone in some instances. American installations have been largely confined to this area. That's why the Gary "test" is significant.

While carbon has cut into the market for blast furnace ceramic

carbon lining in the well of a basic cupola with a water-cooled melting zone. The company also reports use of carbon lining in the tap-hole and breast and in lining of the trough out to the slag dam.

Other developments in refractories have included general shifting from the burned-in openhearth bottom to the rammed bottom, and increasing use of castable refractories, notably in heating furnaces and soaking pits.

Application of castables in openhearth has been limited to furnace doors, furnace runners, hot metal runners, and suspended fan-tail noses.



SLAG REMOVAL . . . A ton of red hot slag being removed from cupola drop room of foundry by International Harvester crawler tractor with dozer shovel.

refractories, its use to date has been less than a third of refractory use in the stacks. Should the Gary test prove satisfactory this percentage could double. From a volume standpoint, this would mean use of about 2 million lb in a furnace where about 500,000 lb is used at the present time. The increase is considerable.

Producers Most Interested

Most active interest in the carbon linings has come from steel producers. Operators of merchant furnaces have been more or less watching from the sidelines.

Lynchburg Foundry Co. reports satisfactory results from use of a

Refractories producers do not foresee extensive openhearth application of cast refractories.

Advantages of cast refractories include: (1) Installation with unskilled labor, (2) easier repair, (3) inventory savings through virtual elimination of special tiles and castings, and (4) impervious qualities when properly installed.

The swing to the rammed openhearth bottom has been due to reduction of installation time from 2 weeks for the burned-in bottom to less than a day for the rammed bottom.

Also, unskilled or semiskilled workers can do a good job of installing a rammed bottom.



FUTURE WELDERS training at Lincoln Electric school.

WELDING: See 60 Pct Market Expansion

Suppliers of welding equipment, materials envision more complete acceptance by industry and builders . . . Education and selling are their big jobs today—By R. M. Lorz.

Welding has come a long way since the "patch work" days of 40 years ago. And the industry is determined to continue its progress.

Producers of welding machines, electrodes and accessories are more enthusiastic than ever because they firmly believe their market can be expanded by at least 60 pct.

Carrying Selling Load

Educational programs aimed at stressing cost reduction through material saving will carry the selling load, along with advanced technology.

In 1952 most welding firms experienced their best year in history. They feel 1953 can be even better. Although they aren't prone to shrug off the possibility of an economic leveling off period, most producers in the trade believe a cost-conscious buyers' market will be tailor made for their industry.

As a case in point welders stress possibilities in the structural and machinery fields. In structural work the all-welded bridge is a talking point. The idea has already taken hold in Europe where threadbare economies have made savings a must.

Trend in this country is gaining

strength according to a recent survey of highway officials. Survey showed that 10 states were using all-welded bridges while 36 states were using welding in many phases of construction and maintenance. Welders claim a weight saving of from 30 pct to 40 pct can be effected in all-welded spans.

Slow acceptance of the idea can probably be traced to suspicion of human error in welding and belief that steel with high silicon content just can't be welded.

In machine fabrication, spokesmen for the welding industry estimate that steel weldments could result in 50 pct savings in some instances if design engineers could be induced to change from conventional thinking.

Need Thinking Switch

Currently, manufacturers of welding equipment can be well satisfied with the status quo. They are at present making and shipping more welding equipment than they were 6 months ago.

However, order backlogs are dwindling and salesmen and district dealers are being given intensive training. Electrode sales, which carried 20 and 30-week delivery tags a few months ago, are

moving faster now and many people believe there will be a surplus in the near future. Possible exceptions are stainless and alloy electrodes, which are still tight—even though welding wire is freer.

Stress Selling

Demand for electrodes is varied, with heavy industry taking all it can get while small shops, farms, and garages have fallen off. Decline in the "mass market" seems to be a sure indication that some selling will have to be done.

Companies who supply building and construction trades say they are doing excellent business despite curtailment of industrial expansion.

Optimism is also founded on recent changes in building codes which permit greater stress allowances. (Rapidly expanding city of Houston is cited as a good example since 14 of 15 multiple story structures recently erected there were welded.)

Raw materials are still a problem to many welding suppliers who complain that they can't place second quarter tickets for steel. Structural shapes, rods, sheets and wire are all giving trouble, but sheet is the most critical item. Copper allotments are coming through with regularity but restricted allowances are hurting some producers. Chemicals are in good supply.

Why Welding's of Age

Sure sign that welding has come of age is evidenced in the increasing demand for automatic and semi-automatic equipment. Further mechanization of such equipment is being pushed to meet demand. The move toward automation in welding will naturally make some standard machines obsolete but producers say it will increase sales in the long run.

Technologically welding of plastic and titanium are receiving the most attention. Some firms already are welding titanium on a production line basis but industry-wide application is still limited. "Hot gas" welding of plastics is still in its infancy but should develop.

HOUSE ORGAN: Does It Tell Your Story?

Industry sinks more time, cash into house organs to tell its story to world and workers . . . Public relations people help . . . Aims clearer . . . Results can be checked—By W. V. Packard.

Don't let anyone tell you that industry isn't becoming more conscious of the need to "tell its story." In addition to huge sums spent for advertising, news releases, open house functions, plant visits, and cocktail parties, industry spends more than \$112 million annually on company publications.

What's more the number of house organs has increased more than 150 pct within the past 10 years. Their combined monthly circulation is more than 70 million—a third larger than all the nation's daily newspapers.

But is industry getting its money's worth? Is it getting its story across to the people it needs to reach? Are company publications achieving the intended results? How do you measure the worth of a company magazine or newspaper?

Men To Fit the Job

These questions are bothering a lot of responsible company officials. And they are constantly challenging growing research facilities of sincere public relations people whose qualifications for counseling must today go far beyond the smile, handshake and handout routine.

For one thing, the story that industry needs to tell is growing as fast, or perhaps faster, than business itself. The job was pretty well spelled out in a letter THE IRON AGE recently received from the president of an advertising and public relations firm.

"It used to be that all a business had to sell was its products.

"Today it must sell employees on the company.

"It must sell the community in which it operates.

"It must sell its suppliers.

"And, let's never forget, it must sell the products."

Being an advertising man, of course he emphasized the word *sell*, but he went on to tell how his firm did this by helping clients set up new house organs or remodel existing ones.

This brings up the question of what a house organ should accomplish. Should it aim at telling the whole company story to

House Organs Growing Fast

Terrific growth of company publications is graphically illustrated by 1952 survey by International Council of Industrial Editors:

It showed 6500 house organs published at cost of \$112 million annually.

Rate of growth was even more significant: More than 60 pct were 10 years of age or less; 29 pct were 5 years old or less; in 1951, alone, 373 new ones were started.

all groups (sometimes called the buckshot treatment)? Or should it be highly specialized, aimed at a special audience. Although there are a lot of examples ranging between these extremes, the well aimed, rifle shot technique is favored by most professionals.

Three-fifths of all company publications are written primarily for employees and their families. Here's what house organs should accomplish says well-known public relations firm.

(1) Give employees a better understanding of their company.

(2) Help make new employees feel they belong.

(3) Boost production by reducing accidents and other causes of absenteeism.

(4) Explain economic benefits of working for the company.

(5) Dramatize the importance of the employee's job.

(6) Spike untrue, morale-crippling rumors.

(7) Help build harmonious relations between management and employees.

(8) Emphasize the company's role as a good citizen of the community.

(9) Add strength and conviction to the American way of competitive enterprise.

How to Measure Results

Management naturally wants to know what return it is getting for its investment in house organs. And editors, if they are to do an effective job, must keep track of reader interests and changes in audience.

For these reasons readership surveys of various types have been adopted, patterned after methods used by trade papers.

Opinion type research surveys are considered most effective in determining impact of company publications. But various other novel methods have been used.

One company launched a campaign in its employee magazine to cut down loss and breakage of safety glasses whose replacement was a company expense. No other medium was used to educate employees on care of safety glasses.

In the following 3-month period replacements, which had been at the rate of 140 a month, dropped to 86, then 49 and finally 23. A saving of about \$500 was realized in 3 months as a result of the magazine campaign. Best of all, the company was convinced of the effectiveness of its house organ.

One public relations firm has set up a service to help editors of client company papers. They suggest story topics' will even write the stories if it's desired. They make suggestions on layout and content and give counsel on costs and other matters.

HEAVIER CUTS IN HARDER MATERIALS AT HIGHER SPEEDS

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Get more out of your machine tools . . . raise your production curve . . . with Gorham "M-40-B" turning tools! Use "M-40-B" wherever the application of a Super High Speed Steel is indicated, as in machining heat treated alloy steels with large amounts of stock removal at high surface speeds.

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"M-40-B" comes in square tool bits, 11 stock sizes, and in 23 stock sizes of rectangular turning tools. Bits and turning tools are accurately ground, uniformly hardened, ready to sharpen. Special sizes and shapes to your order. Illustrated with prices are three popular size "M-40-B" tool bits. See your distributor, or send direct for a trial order.

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Manpower

DRAFTING: Simpler

GE's streamlined drawings expected to save \$60,000 . . . May cut manhours in half.

Savings of 20 to 50 pct in man hours and perhaps \$60,000 a year in the cost of drafting paper may result from a newly adopted policy of the General Electric Co. The idea is simplicity.

Draftsmen—over 5000 are employed by the firm—have been instructed to simplify their drawings and eliminate all the unnecessary frills. If a line is not needed to help put across the idea contained in the drawing it just isn't put in.

But the policy isn't an excuse to permit sloppy, unclear work. Artistry is eliminated while clarity must be retained. The firm has a slogan: "A superfluous line is a waste of time."

Time and Money

GE cites an instance where a drawing of 57 sq ft was replaced by one of only 4 sq ft. It took a man 8 days to do the first, only 2 days to do the second. This 75 pct reduction in man-hr not only saves money it also stretches available skilled manpower—now in shortage.

Paper savings themselves represent a huge cost advantage since GE uses more than 75 million sq ft per year. The firm estimates it will save over \$60,000 annually in the cost of paper for its engineering and drafting departments.

Use of the free-hand drawing, wherever possible, is being stressed. And, when a written description will suffice to put across an idea, no drawing at all is made.

Idea's the Thing

Judicious use of these principles is both practical and economical, according to GE tests. Average actual drawing time for draftsmen has been cut between 20 and 30 pct.

Special emphasis is placed on the secondary nature of the draw-

Drawings Save Time

ing itself. The important aspect of a draftsman's job is thinking and drawings are merely a means of getting his ideas across to others whether they are his superiors or the man in the shop.

As a further means of combating the skilled manpower shortage, GE is taking much of the load of non technical work from technical people. They have found that science students, high school graduates or skilled technicians can do much of the detail work that hobbles top scientific minds.

Steel Sets New Safety Records

Blast furnace and steel mill workers continued to pile up new safety records during the first 9 months of 1952, according to latest available statistics from the Labor Dept.

With an injury rate of 6.2 injuries per million man-hr, their safety records not only led the steel industry as a whole but was approximately one-half the 13.8 rate for all manufacturing industries.

Slight increases in injury rates for the first three quarters were registered by tube and pipe mills as well as wire drawing work.

Although their injury rates were greatly reduced during 1952, gray iron and malleable foundries continued to show the highest figure within the ferrous metal industry, about 32.2.



"Nobody is gonna leave because of their treatment around here."

Sometimes

"Who Says So?"

is **Mighty Important!**

PLANNING and engineering fire protection—especially for those key hazards where fire can hit like lightning and with crippling effect—is a job for experienced specialists only. Knowing "who says so" and his qualifications may save you from huge loss.

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SOVIET-style automatic transfer machine used in Moscow cylinder plant.

ROBOT PLANTS: Reds Try Our Way

Russia is pushing to catch up with the U. S. in automatic plant and assembly line production . . . How a robot piston plant works . . . Run by four workers, boosts output nine times.

Straining to cut America's lead in mass production, the Reds are pressuring expansion of automatic plants and assembly line manufacturing techniques.

Timetable of Russia's current Five Year Plan calls for triple the present number of automatic factories and assembly lines by 1955. Considering that the Reds are starting from a low point this increase is only superficially impressive. The U. S. is far ahead.

Had It 10 Years Ago

IRON AGE correspondents have reported that the Soviet installed its first automatic transfer machine in the Stalingrad Tractor Plant early in 1940. It is estimated that there are now about 40 of these machines in operation in Russia producing motor blocks, cylinder heads and tractor parts.

In addition, the Reds are believed to have automatic metallurgical plants, chemical factories and remote-controlled electric power stations.

The Reds report one of their automation developments is a robot piston factory in Moscow, established in 1950. From ingot to packaging of the finished piston, all operations are completely automatic.

Though probably no better than many automated plants in the U. S., the Russian factory at least rivals some of our up-to-date engineering achievements.

No figures are available, but output from the Moscow plant is reported to be nine times that of conventional Russian production lines. Basic staff of the piston factory is four operators per shift. In addition there are a few skilled tool setters who stand by in case repairs are needed.

Automatic production at the plant starts when aluminum alloy ingots are dropped by conveyer belt onto a furnace loading platform.

As the ingot falls, the furnace door opens and the ingot is pushed in mechanically.

Six Mold Rotary Caster

After being melted in the furnace, the metal is automatically poured into a six-mold rotary casting machine. A needle valve, synchronized with the movement of the molds, regulates the flow of metal.

Castings are mechanically extracted from the molds, and move to a milling machine for rough machining. Despite the heat of the

castings at this stage, the tools are reported to perform 50,000 operations without resharping.

The pistons then go through a tempering furnace where they are kept at 392°F for 6 hr. After heat-treating, they are tested by the steel ball press method. Depth of impression is measured electrically and rejected castings are returned to the furnace by an under-floor conveyer.

Pistons which pass the test, move to a storage bunker which feeds the rest of the line.

Seven-Station Transfer

Up to this point, the automatic line operates 24 hr per day. Since the melting-casting operations are slower than machine tool output, the rest of the line operates only 16 hr per day.

After leaving the bunker, the first machine faces the head and makes a centering point for turning operations. The next machine is a seven-station transfer unit which completes most of the machining.

Pistons are then conveyed to a weight adjustment unit which weighs the pistons and also cuts metal from the underside. Finish grinding is completed on a centerless grinder.

Apply Tin Coat

A tin coating is applied by chemical immersion. Even the chemical solution is controlled mechanically.

Final machining consists of reaming the wrist-pin hole and finish-forming the grooves. The pistons are washed, inspected, sorted and stamped. At the end of the line they are dipped in hot oil, wrapped in paper, and boxed in sets of six.

Interruptions at any point in the production are registered at a central control panel where output at different stages along the line is recorded.

The Russians are also said to have completed tests on another automatic factory designed to produce tractor piston pins. Production at this plant is believed to be 300 pins per hr.

ORE: Expands Jasper Development

Cleveland-Cliffs undertakes second huge Jasper development . . . Initial cost placed at \$26.5 million . . . Venture parallels Ford partnership . . . Others work Mesabi—By R. M. Lorz.

Mining and steel industry leaders aren't taking any chances of being caught short as rich deposits of open pit ore dwindle in the Lake Superior region. They are convinced it is economically feasible to concentrate low grade ore—a multi-million dollar program has already been launched to get the program rolling.

The program entered a new phase last week when Cleveland-Cliffs Iron Co. revealed plans for a \$26,575,700 project to be started soon at Republic, Mich.

Picking Up Speed

Defense Production Administration has already approved a 75 pct fast tax writeoff and officials of the Cleveland firm are getting ready to erect two plants for beneficiating and concentrating jasper hematite.

New units at Republic mine will be completed in mid-1955 and will turn out 400,000 tons of concentrates annually. By that time Cleveland-Cliffs and Ford Motor Co. expect to be taking an additional 400,000 tons annually from their jasper mine at Humboldt, Mich. The two firms are joint owners of this mine.

Humboldt Plant by '54

The Humboldt venture, undertaken jointly in 1951, is expected to be completed late this year or early in 1954. At Republic, Lake Superior & Ishpeming Railroad has pushed a spur into the valley behind the red bluffs and construction is expected to begin soon.

Once the big electric shovels gouge into the Marquette range and crushing operations are started, gravity separation and froth flotation will be used to separate fine iron particles for agglomeration. Cleveland-Cliffs, sole owner of the Republic mine, explained

that no provisions had been made for agglomerating at the Humboldt Mine, since Ford Motor Co. plans to treat concentrates in its own plant.

Laying Out Huge Sums

Development of jasper in Michigan closely parallels a really tremendous outlay for concentrating taconite on the Mesabi Range in Minnesota. Most recent development in this area was spurred by Reserve Mining Co. when it sold a \$148 million bond issue to finance

Sheet & Tube and Interlake Iron Corp. will share the estimated cost of \$300 million.

No Need for Haste

Biggest question mark in the field right now is U. S. Steel's Oliver Iron Co. The Corporation's subsidiary has spent \$23 million on a laboratory and pilot plant at Iron Mountain, Mich. But with half the known reserves at its command Oliver is inclined not to hurry. The Iron Mountain pilot plant is expected to start producing at rate of 500,000 tons per year early this year. U. S. Steel's ore future is secured by high grade concessions in Venezuela, in addition to Mesabi holdings.

Since these developments are actual and have passed the talking

Box Score on Taconite

Mining Company	Owned By	Developed By	Present Annual Production (Gross Tons)	Estimated Future Production (Gross Tons)
Reserve Mining....	Republic and Armco....	Ogleby-Norton Co....	300,000	10,000,000
Erie Mining.....	Bethlehem, Youngstown Sheet & Tube and Interlake Iron.....	Pickands-Mather....	200,000	10,500,000
Oliver Mining.....	U. S. Steel.....	U. S. Steel.....	None	500,000 (1953)
Humboldt Mine....	Ford Motor and Cleveland-Cliffs.....	Cleveland-Cliffs.....	None	400,000 (1953)
Republic Mine....	Cleveland-Cliffs.....	Cleveland-Cliffs.....	None	400,000 (1955)

a plant for processing taconite at Beaver Bay, Minn. Reserve, owned by Republic and Armco Steel Corp's., had set aside \$75 million in the fall of 1951 to cover construction of the big plant at Beaver Bay and a smaller pilot plant at Babbitt, Minn.

If present plans mature, Reserve hopes to be processing 2.5 million tons of concentrates by 1955. Ultimately it hopes to increase production until annual output reaches 10 million tons.

That schedule is ambitious. But Erie Mining Co. plans to match it, then go a little further. When its pilot plant at Aurora, Minn., has been enlarged to full capacity, Erie hopes to turn out at least 10.5 million tons of concentrates yearly. Bethlehem Steel, Youngstown

stage, some authorities foresee a billion dollar "manufacturing" industry turning out over 20 million tons of concentrates by 1960. Those who predict depletion of high grade Lake Superior ore within the next 15 years are hoping the vision of a renewed ore supply will be realized.

Uranium-Bearing Shale Studied

In a two-pronged attack on the problem of recovering uranium from bituminous shales in the southeastern U. S., Atomic Energy Commission is opening a small experimental mine near Sligo, Tenn., and getting the aid of Columbia Univ. in developing an effective process for extracting the vital material.

Industry Controls This Week

Aluminum—Amend. 2, SR 113, GCPR permits producers of aluminum mill products to determine their new ceiling prices either by adding 9.2 pct to their GCPR or by adding 4 pct to prices established under SR 113.

Automotive—Amend. 36, 37 and 38, GOR 9 remove price controls from sales of custom-built passenger cars, foreign made used passenger cars and modified passenger automobiles. Amend. 5, GOR 42 grants manufacturers of automotive lifts a 7 pct ceiling price increase, but Amend. 11, GOR 35 prohibits these manufacturers from raising ceiling prices under the provisions of GOR 35 and SR 9, CPR 30.

Castings—Amend. 1, SR 1, Amend. 1, SR 2, Amend. 1, SR 3, CPR 60 point out that earnings standard increases authorized for producers of malleable iron, carbon or low alloy steel, manganese steel and gray iron castings must be applied to the ceiling prices in use on the effective date of each SR.

Machinery—Amend. 6, SR 4, CPR 30 allows manufacturers of machinery and related products, including automotive parts, to apply for permission to file separately for Capehart adjustments on any of their production units under autonomous management.

Graphite Crucible Prices Freed

Sales of graphite crucibles and fuller's earth no longer are bound by price restrictions.

Category listed by Office of Price Stabilization as "graphite crucibles" also includes carbon bonded silicon-carbide crucibles and related crucible accessories in which natural graphite makes up at least 15 pct of total weight.

Exemption for the items named was provided by Amend. 39 to General Overriding Reg. 9, effective Feb. 5.

Tin Inventory, Use Curbs Lifted

National Production Authority over the weekend removed all controls over the uses and inventories of tin by the simple expedient of revoking five orders—M-8, M-24, M-25, M-26, and M-27.

This means that the only control now retained by NPA over tin is

the reporting requirement under which consumers and dealers must continue to list monthly receipts, shipments, consumption, and stocks.

Acting Administrator H. B. McCoy said the supply of tin contracted for and otherwise obtainable in world markets is now foreseen as sufficient to meet demands for both defense and civilian goods.

Copper Mill Prices Specified

Specific ceiling prices for a number of copper wire mill products previously unlisted in Ceiling Price Reg. 110 are provided in a new amendment to the regulation.

Office of Price Stabilization broke into its decontrol activities by issuing Amend. 4 to CPR 110, dated Feb. 5. This action is expected to make unnecessary the use of a formula or special procedures in determining ceilings on many items.

Amend. 4 corrects several clerical errors in applicable price books. In addition, it adds ceiling figures for previously unlisted sizes and construction of reels, spools, and cases.

Construction

Steel Inquiries and Awards

Fabricated steel awards this week include the following:

235 Tons, Camden County, N. J., bridge at airport circle on Route 25 for New Jersey State Highway Dept., to Bethlehem Steel Co., Bethlehem.

Fabricated steel inquiries this week include the following:

9500 Tons, Superstructure of Raritan River Bridge on the Garden State Parkway, New Jersey State Highway Dept., bids due Feb. 19.

Reinforcing bar awards this week include the following:

1000 Tons, Philadelphia, parking garage at 10th and Ludlow Sts., for city of Philadelphia, McCloskey & Co., same city, general contractor.

850 Tons, Philadelphia, parking garage at 18th and Walnut Sts., for city of Philadelphia, Turner Construction Co., New York, general contractor.

425 Tons, Philadelphia, University of Pennsylvania physics laboratory, Barton Construction Co., same city, general contractor.

350 Tons, Willow Grove, Pa., aircraft maintenance building at Willow Grove Naval Air Station, Lipssett, Inc., New York, general contractor.

110 Tons, Pottstown, Pa., nurses' home and addition to Pottstown Hospital, H. E. Keefer & Son, Philadelphia, general contractor.

Reinforcing bar inquiries this week include the following:

139 Tons, Tolland, Willington, Ashford and Union, Conn., a section of the Eastbound roadway on Route 15, includes extension to a rolled beam bridge and seven reinforced concrete box culverts. B. B. Burdick, Hartford, Conn., district engineer.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Cups, B. J. Gilding Metal Clad Steel, annealed cal. .30 ball, 249500, \$172,155, Superior Steel Corp., Carnegie, Pa.
Refrigerators, 508 ea, \$63,469, Nash-Kelvinator Sales Corp., Detroit.
Bomb, GP, 100 bl, 113600 ea, \$2,661,688, R. G. LeTourneau, Inc., Peoria, Ill.
Shell, HE, M329, 4.2" mortar, 294000 ea, \$2,546,334, Hardwicke-Etter Co., Sherman, Texas.

Spare parts for personal heater kits, 86 line items, \$53,650, Stewart Warner Corp., Indianapolis, A. N. Phillips.

Test set, indicator, 456 ea, \$1,806,220, Airborne Instruments Laboratory, Mineola, N. Y.

Spare, parts, flamethrower, 1200 ea, \$56,309, J. P. Blair Co., Mineola, N. Y.

Steel bins of var sizes, 15 item, \$133,202, Supreme Steel Prod., Inc., Maspeth, N. Y.

Spacer, bolt, cover, steering brake, var, \$95,439, Stevens Mfg. Co., Ebsburg, Pa.

Projectile, practice, 275000 ea, \$108,240, Pantex Mfg. Co., Pawtucket, R. I.

Spark plug lead assy, var, \$234,350, Breeze Corps, Newark.

Fuel valve, 150 ea, \$74,935, The Parker Appliance Co., Cleveland.

Gage, engine unit, 1669 ea, \$154,869, Thomas A. Edison, Inc., West Orange, N. J.

Maintenance parts for var aircraft, var, \$81,257, Lear, Inc., Grand Rapids.

Wheel assy, 1287 ea, \$214,041, Goodyear Tire & Rubber Co., Inc., Akron.

Transmitter, pressure, var, \$64,214, Mach. & Metal, Inc., Sellersville, Pa.

Valves, hydraulic, var, \$65,137, Electrol, Inc., Kingston, N. Y.

Parts for aviation armament, var, \$448,525, Hughes Aircraft Co., Culver City, Calif.

Maintenance parts, var, \$102,448, Fairchild Camera & Instrument Corp., Jamaica, N. Y.

Spare parts for aviation armament, var, \$212,187, W. L. Maxson Corp., New York.

Spare parts for aviation armament, var, \$290,285, Hughes Aircraft Co., Culver City, Calif.

Maintenance parts, brake & wheel assys, var, \$571,268, Goodyear Tire & Rubber Co., Akron.

Trap & spacer assy for 3/5" rocket, 700000 ea, \$206,500, Eastern Tool & Mfg., Belleville, N. J.

Replenishment of tanks & combat vehicle parts, 1500, \$354,722, Minneapolis-Honeywell Regulator Co., Minneapolis, S. F. Keating.

Replenishment of hardware, 195726, \$1,221,494, Campbell Chain Co., York, Pa.

Replenishment of tanks & combat vehicle parts, 4000, \$43,600, The Gabriel Co., Cleveland.

Replenishment of motor vehicle parts, 25000, \$859,500, Federal Fawick Corp., Detroit.

Replenishment of motor vehicle parts, 20945, \$50,848, Dana Corp., Toledo.

Drills, twist, 142026, \$59,132, United Drill & Tool Corp., Chicago.

Cylinder assy, var, \$51,097, Texas Aircraft Supply Co., Dallas.

Repair parts for pumps, 16555, \$41,818, Pacific Marine Supply, Seattle.

Repair parts for diesel engines, 28975, \$39,762, The Cooper-Bessemer, Mt. Vernon, Ohio.

Pumps and fixtures for diesel engines, 200, \$45,020, Bacharach Industrial Instr. Co., Pitts, Pa.

Gear, high range, 2000, \$128,640, The Studebaker Corp., South Bend, Ind.

Tractor transmission assy, 200, \$217,082, Allis Chalmers Mfg. Corp., Milwaukee, F. R. Worley.

Primer, percussion, M28B2, MPTS, 1500000, \$362,025, Happer Wyman Co., Chicago.

Fin, shell, \$75000, \$425,923, Line Material Co., Milwaukee.

Shell, HE, 155 MM, 300000, \$9,081,000, Pressed Steel Car Co., Chicago.

Tank-automotive spare parts, 119, \$48,745, Dunbar Kapple, Inc., Geneva, Ill.

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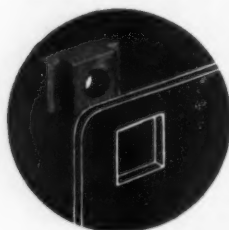
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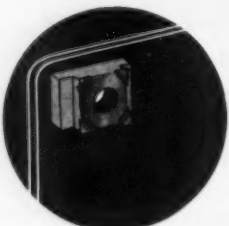
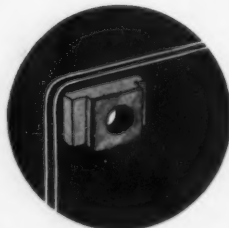


1

The square shape simplifies installation.

2

The small square portion is inserted and protrudes through the square hole that has been previously punched.



3

The protruding portion is now clinched at 4 corners with swaging tool.

4

Nut cannot work loose and variation in thickness of metal is taken care of automatically.



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Industrial Briefs

Coke Battery — KOPPERS CO., INC., has been awarded a contract to design and construct a battery of 41 chemical-recovery coke ovens for Weirton Steel Co., a division of National Steel Corp., at its Weirton, W. Va., plant.

Butterfly Valves—SALEM-BROS-IUS, INC., Pittsburgh, has received from the National Advisory Committee for Aeronautics, Lewis Flight Propulsion Laboratory, Cleveland, a contract for the design and construction of two 15-ft-diam butterfly valves for use in aircraft propulsion research.

Big Addition—REYNOLDS METALS CO., Richmond, Va., has signed a contract with the U. S. Navy for a \$7.5 million addition to its plant at McCook, Ill.

Changes Name—HARRIS STEEL CO., Kearny, N. J., is the new name of Harry Harris & Co. Jerome E. Harris has been appointed president.

Coming Up—NATIONAL ASSN. OF MANUFACTURERS Institute on Industrial Relations will be held March 16-20, in Hollywood Beach Hotel, Hollywood, Fla.

Buys Division—DIVISION LEAD CO., Chicago, has purchased the Metallic Products Div. plant of Eagle-Picher Co., at Argo, Ill.

Moving Out — JOHN HASSALL, INC., Brooklyn, plans construction of a new modern plant in Westbury, N. Y. Present facilities no longer lend themselves to economical operation or expansion.

Elected—Robert J. Ryan, NOOTER CORP., St. Louis, elected president, Steel Plate Fabricators' Assn. at its annual meeting last month.

In Milwaukee—PHELPS DODGE COPPER PRODUCTS CORP. has opened a district sales office at 2408 N. Farwell Ave., Milwaukee. Lewis E. Pillsbury will be resident manager.

French Visitors — LEBANON STEEL FOUNDRY, Lebanon, Pa., was visited recently by a French national defense team on armored vehicle and tank production, surveying productivity techniques of U. S. firms manufacturing armored vehicles.

Erecting—LURIA ENGINEERING CO. is erecting a 12,000-sq-ft warehouse for the Wilmington Paper & Twine Co., on Fourth St., Wilmington, Del.

In Operation—U. S. Steel's CLAIRTON WORKS pushed coke last month for the first time at its new No. 14 coke battery.

Chosen—BLAW-KNOX CO., Pittsburgh, has been selected to design and build a \$1 million "cat-forming" plant to produce high octane gasoline for the United Refining Co., at Warren, Pa.

Chicago Warehouse—VANADIUM-ALLOYS STEEL CO., Latrobe, Pa., has opened a new Chicago warehouse at 6632 W. Diversey Ave. with W. R. Mau in charge.

Open House—A. M. CASTLE & CO. held open house to inaugurate the formal opening of its new steel warehouse at 2500 N. Main St., Rockford, Ill.

New Chief — CUTTING TOOL MANUFACTURERS ASSN. has elected Gordon Birgbauer, president of Super Tool Co., its president.

Buys Land — EDGCOMB STEEL CO., Philadelphia, has purchased 7 acres of land in York, Pa., on the Columbia Div. of the Pennsylvania R. R. for a steel warehouse.

Fair Exchange — CONTINENTAL CAN CO. has acquired the assets and business of the Benjamin C. Betner Co., Devon, Pa., in exchange for 73,177 shares of common stock.

Congratulations—Milton Goldstone, Pittsburgh, is the 500th graduate of the GENERAL MOTORS INSTITUTE course in replacement parts management held at the Flint, Mich., technical school for the past 4 years.

Supply House—BALAAM BROTHERS is a new welding supply business featuring route delivery of supplies and consultation on welding problems, at 1421 Park Ave., Emeryville, Calif.

New Offices—CALIFORNIA METALS CO., Oakland, Calif., is now operating from new offices at 360 17th St.

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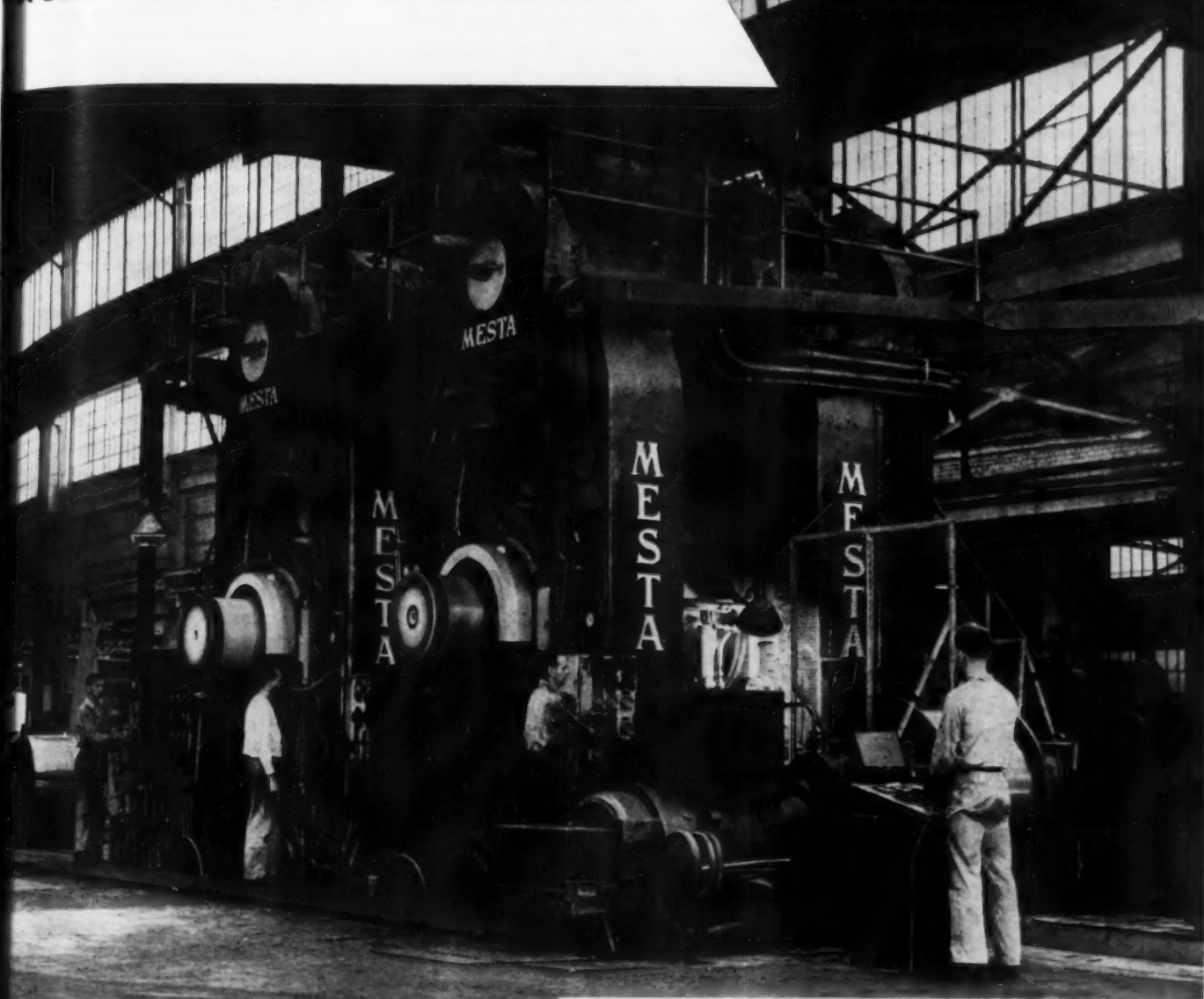
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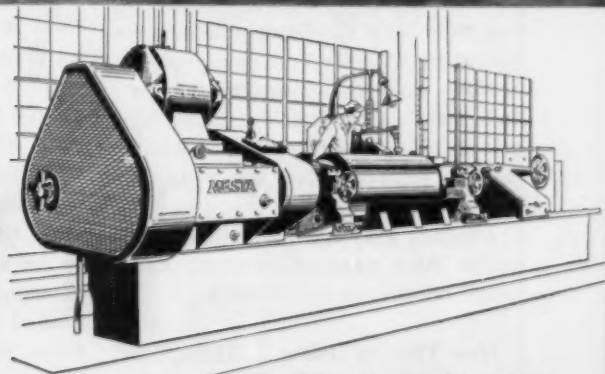
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The Automotive Assembly Line

Automakers Prosper in Output Boom

High auto production revitalizes all sections of industry . . . Labor shortage develops . . . Chevie still leads, but Ford shows greatest percentage gain over '52—By R. D. Raddant.

Flexing its production muscles, a revitalized auto industry grinds out cars today at a rate that means prosperity for all segments of the industry.

in January: General Motors turned out 206,812 passenger cars, and 47,924 trucks for a total of 254,736. Total January production under tight government control in

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
Feb. 7, 1953	124,901*	24,280*	149,181*
Jan. 31, 1953	125,283	25,006	150,289
Feb. 10, 1952	76,403	26,003	102,406
Feb. 3, 1952	74,890	27,512	102,402

*Estimated

Source: Ward's Reports

Change in atmosphere from a year ago is almost unbelievable. Under strict production controls at that time, Michigan and Detroit unemployment was a critical problem.

Today it is a labor shortage that presents a problem. This has its serious aspects, but in general reflects a healthy prosperity.

Output Did It . . . Change in conditions in this automotive capital lies in a single factor—car output. And not all cars by any means are made in Detroit. A prosperous condition here means that similar conditions are reflected wherever the industry's far-flung plants are operating at near full capacity.

Now that the industry has a full month's production under its belt in 1953, an evaluation of what can be expected for the year is possible.

January may not be typical, because later production rates can hinge on future sales trends.

How They're Doing . . . Here, for example, is the Big Three score

1952 was only 178,989 vehicles.

Chrysler Corp. reached a January production of 118,989 total vehicles of which 10,985 were Dodge trucks. In the same month of 1952, production was 91,499.

Greatest percentage gain was made in Ford divisions, primarily because a late model introduction in 1952 kept January production at a low rate. Total January this year was 122,231 against last year's 41,479.

Chevie Leads . . . First in production, of course, is Chevrolet, operating at a rate of 27,500 cars a week and going higher. Saturday work is scheduled at most Chevrolet plants to increase this rate.

Ford is working at a rate of nearly 20,000 cars a week. Plymouth hits about 12,000 cars each week to maintain third spot.

Buick is pushing at a rate of more than 9000 a week and Dodge is crowding 8000. An indication of what these rates mean is furnished by Dodge. Foundry operations requiring two shifts of 10 hr each are needed to provide the

engine blocks and other castings to maintain this rate.

Independents Gain . . . Some of the surprises in production are in the independents. Nash is leading at a rate of more than 4000 cars a week and has improved its rate each week since Christmas.

In spite of the fanfare that accompanied its new model introduction, Studebaker is still around the 3000-per-week mark. It apparently has not hit its production stride with the radically changed new line.

Packard, revitalized under a new management, is turning out 2700 cars a week on two assembly lines. This company produced only 63,000 cars in 1952 but has now doubled that rate.

Sportster Readied . . . Outlines of the new Kaiser-Frazer Fiberglass sports car continue to evolve as it begins to take shape as a car ready for the market. K-F recently announced it will go into production of several thousand of the low-slung 2-seaters in mid summer.

The car, designated at the moment as the DKF-161, will have a high compression 6-cylinder engine with multiple carburetion. Its horsepower is still undisclosed, but it is supposed to provide acceleration of the light car from 10 to 70 mph in high gear in 15 sec, fast enough for any hot rod.

It will have a ground cowl height of only 36 in. and will provide a sports top which is completely concealed in a compartment under the deck lid.

Trucks Abroad . . . Almost half of the total automotive vehicles sold abroad during 1952 were trucks or commercial vehicles.

The Automobile Manufacturers Assn. annual tabulation of sales shows that of the 329,572 vehicles exported in 1952, 161,660 were motor trucks and 864 motor coaches against 167,048 passenger cars.

LABOR: Ponder Ike-Reuther Talks

Continuance of old index hurts new contract chances . . . End of wage curbs spurs pay boosts . . . Annual wage issue not taken seriously . . . Strike danger remains—By R. D. Raddant.

Probably a million auto workers wondered where they stood Friday when their spokesman and president, Walter P. Reuther, went into White House discussions with President Eisenhower.

Auto companies must have had their own questions. The UAW president, also wearing the hat of the president of the CIO, had talked quite tough. But he had conceded that differences with management could be settled peacefully at negotiations over the bargaining table.

Jerks Out Rug

Entire broad issue of UAW contracts goes back to the Bureau of Labor Statistics' old cost of living index. It is now history that the UAW had hoped to use the substitution of a new index as a wedge to reopen contracts that have more than 2 years to run.

As one General Motors official put it, the rug was jerked from the demands when the Administration agreed to continue the old index until adjustments could be made.

These demands included a lifting of the basic wage to a point within 5¢ of the current level, increased pensions, and an increase in the annual improvement factor. An annual wage was also mentioned, but not taken seriously by either side for the moment. This demand is a "scare" tactic.

Keep Talking

Before leaving for his appointment with President Eisenhower, Mr. Reuther sent letters urging the industry to continue negotiation on adapting the new cost-of-living index to existing contracts. He also announced that a continuance of the old index was "unacceptable" to the union.

The UAW's position was made no more comfortable by the end of wage controls. This will undoubtedly touch off a series of

wage increases throughout many segments of industry. Some increases had already been negotiated, but held in abeyance by wage controls.

But auto workers remained bound by 5-year contracts. They are geared directly to cost-of-living scales and an annual 4¢ per-hr improvement factor wage raise. Had the old index not been continued, the door would have been opened for new wage demands. By continuing the old index, the 5-year contracts appear permanent.

This has not completely stopped Mar. 1 strike talk in Detroit. A factor that may stimulate aggressive union action is that the government may be a month late in reviving the old index. Next wage adjustment is due Mar. 1, but



TESTING unit used by Chrysler Corp. to bend auto crankshafts. This instrument bends shafts up to 500 times per min.

latest reports were that the index will not be ready until April.

Strike references have been carefully avoided in official union statements. These indicate that "differences" can be ironed out by peaceful bargaining.

THE BULL OF THE WOODS

By J. R. Williams

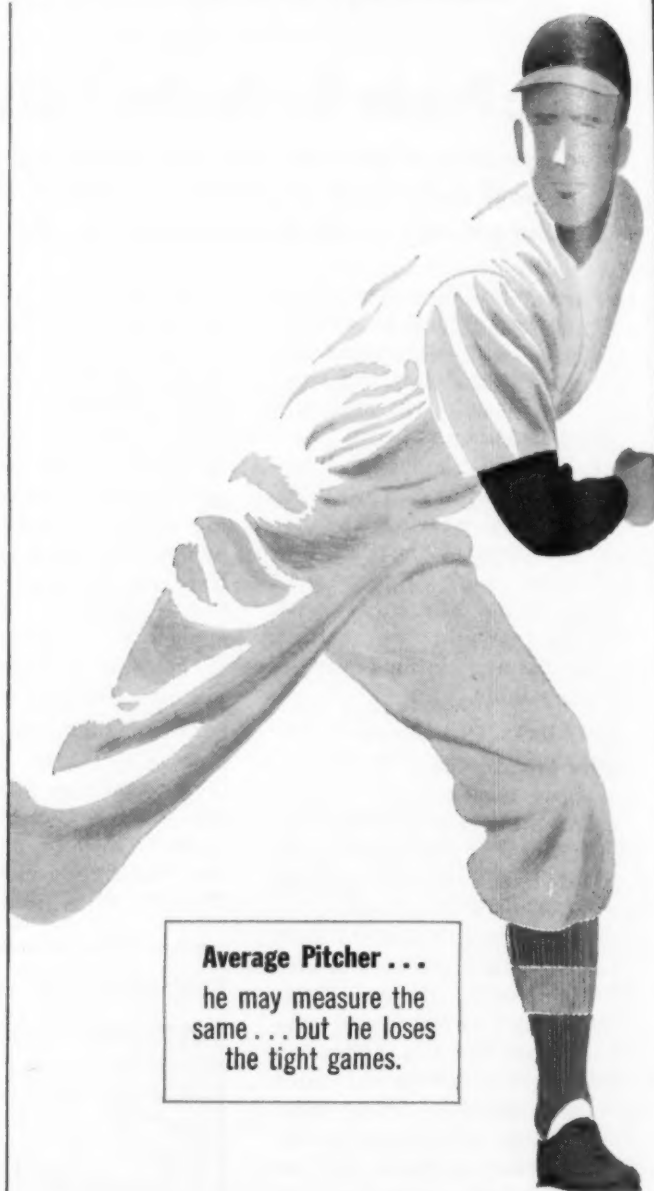


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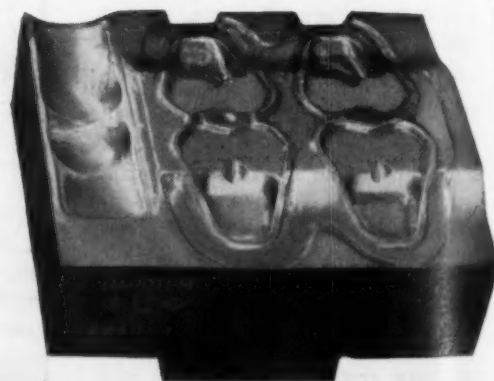
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This Week in Washington

Corral Military Sacred Cow Spending?

Congress wants to get many appropriations bills into one package for accurate comparison to revenue . . . Also eye military's unspent fund carryover to next year—By G. H. Baker.

Washington's tangled fiscal category of "unobligated appropriations" is due for some drastic straightening out. Until now this spending money for future military procurement has been regarded as a "sacred cow."

Congressional support is growing for legislation backed by Sen. Harry F. Byrd, D., Va., to return to Congress control over the military purse that it has surrendered in recent years.

Tie Loose Ends . . . Briefly, what Mr. Byrd and his backers (including many Republicans as well as Democrats) hope to accomplish is the year-by-year fixing of a top figure on government spending.

An important feature of this plan is tying together all the dozen-odd annual appropriation bills into one package. This would enable Congress and the public to compare at a glance the total amount being appropriated against the total anticipated revenues for any fiscal year. Piece-meal appropriation bills, it is felt, tend to obscure annual spending totals of the services.

Cash Carryover . . . "Unobligated appropriations," a fiscal gimmick put into effect at the beginning of the Korean war, permit the Army, Navy, and Air Force to carry over from one fiscal year to the next any unspent appropriations authorized by Congress.

Sen. Byrd points out that the military is thus permitted to snowball its unspent funds over a period of years while getting new money grants from Congress on

an annual basis. Today, for example, the Air Force has a \$62 billion kitty that an economy-minded Congress wants turned back to the U. S. Treasury. Air Force insists that it needs all of this sum to pay contractors for unfilled, long-range orders.

Congress agrees with the military that bills for firm defense supplies are to be met without quibbling, but feels that a \$62 billion fund is beyond the "petty cash" category. As a result, a determined move to whittle at least \$5 billion to \$6 billion from this fund will get under way at the Capitol within the next few weeks.

No Flat Ceiling . . . It is important for business to keep in mind that the economy order issued last week by Budget Director Joseph M. Dodge does not place a flat ceiling of \$3 billion per month for military procurement, as interpreted in some congressional circles — or, rather, misinterpreted.



Mr. Dodge was careful to use the following clarifying language in his cut-back order: "The January rate of obligation (\$3 billion, in the case of the military) by the department or agency shall not be increased except on complete justification and specific approval, unless such increases are clearly necessary to meet requirements fixed by law."

Thus, outstanding commitments for procurement of aircraft, tanks, and other long-range products are, for the most part, to be billed and accepted on schedule.

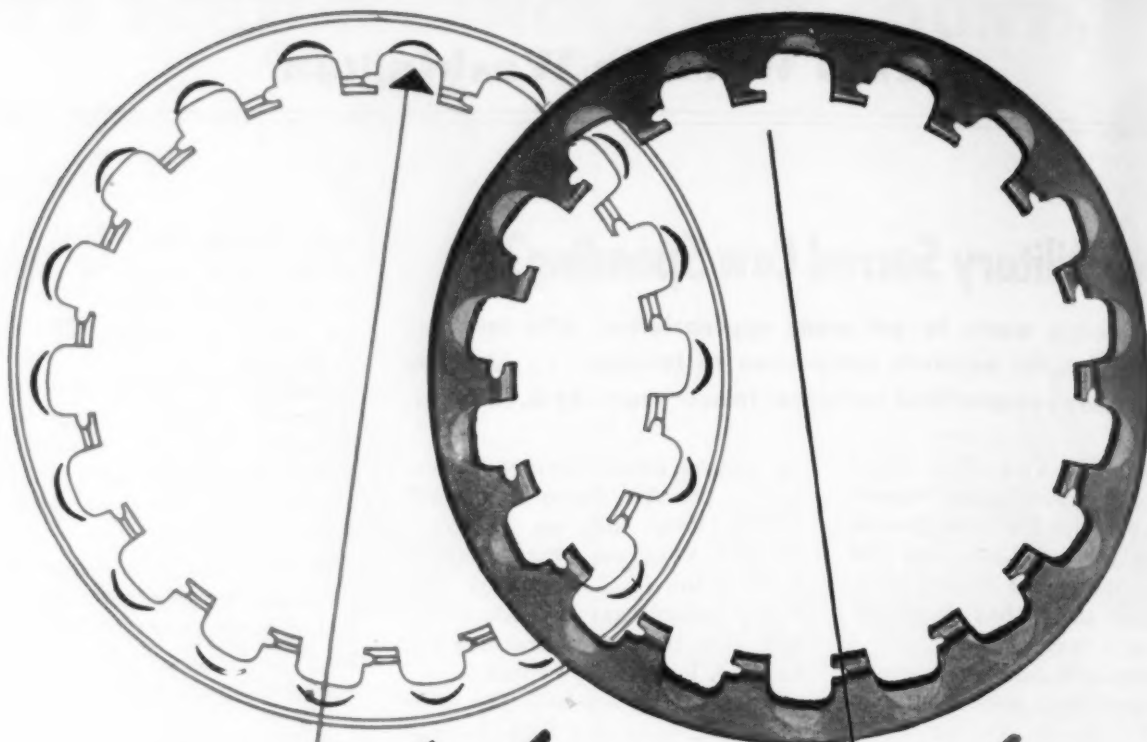
Taft's Troubles . . . Trouble is brewing in Congress over Sen. Taft's 16 proposed changes in the labor law he co-authored nearly 6 years ago. Trying to offer concessions to both labor and management, the Ohio Republican wound up with neither side his friend.

Probably the most important change offered by Sen. Taft is his proposal to end the existing ban on voting in representational elections by strikers who have been replaced. This is a direct response to President Eisenhower's on-the-record campaign demands that potential union-busting features of the Taft-Hartley law be removed.

Union Busting? . . . Theoretically (but not likely) a company in times of economic distress could fire all its workers in order to get rid of a union, it's pointed out. A representational election could then be participated in only by the new workers. The cards would be stacked, it's argued.

Any replaced workers, as the law now reads, are barred from voting in such elections.

Stiff Fight Shaping . . . A major fight is in the making over another proposed change which would legalize, in most cases, secondary boycotts. Industry is preparing to put up a stiff fight over this sug-



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CINCINNATI

question. It is said that the existing prohibitions against secondary boycotts would be rendered meaningless by the proposed changes.

Another proposal would cut from 30 days to 7 days the period in which new workers in the building trades have to join a union where union-shop agreements exist. Trouble lurks here, also. This proposal is termed by some congressmen as "a step in the direction of compulsory unionism."

Slated to Stay . . . Current tax schedules governing the depletion allowances that may be claimed by producers of metals, minerals, oil, and gas are now unofficially—but authoritatively—slated to remain at their present levels.

Advocates of smaller allowances aren't going to get anywhere this year. A majority of Democratic members are lining up with their Republican colleagues in a move to hold the present rates "as is."

"We Have Votes" . . . Mining-state congressmen and members of the tax-writing committees of the Senate and House believe they have more than enough votes to prevent the further removal of production incentive from these all-important defense industries.

Opposition camp is headed by Sens. Douglas, D., Ill., and Humphrey, D., Minn.

Premature Tax Talk . . . Talk of tax reduction at any early date is premature, a survey of high-ranking congressional tax-writers shows. The only prospective reduction that's being seriously discussed at this time is the scheduled expiration of the excess-profits levy on June 30.

In the House, there is fairly strong bipartisan support for plans to lower the rates on individual and corporate incomes on June 30, instead of waiting for automatic reductions to take effect at the end of the year. But Senate attitude is cautious. Let's talk about a balanced budget first, Finance Committee members reason.

Navy Speeds Airframe Contracts

Airframe manufacturers and Navy Bureau of Aeronautics are now negotiating new "basic agreements" to expedite the handling of possible defense contracts.

The initiative in contacting airframe firms was taken by Navy's BuAer, which last week announced the signing of an agreement with Lockheed Aircraft Corp. This action indicated an understanding

will continue to fill their ranks with volunteers.

April call-up will bring to 1,361,430 the number of men drafted since the outbreak of the Korean war.

Defense Dept. officials say draft calls for the Army probably will continue at the same rate—or even higher—during the next few months because of the need for replacing draftees whose terms of service will expire soon.



DEFENSE team for the Eisenhower Administration was completed when Army, Navy and Air secretaries were sworn in. With the President are (l to r): Deputy Secretary of Defense Kyes, Army Secretary Stevens, Navy Secretary Anderson, Air Force Secretary Talbott, Chief of Staff Bradley and Secretary of Defense Wilson.

exists between Lockheed and the Navy agency as to certain provisions for inclusion in any future contracts.

Provisions agreed on, consisting of two categories of contract clauses, need merely be referenced in a supply contract signed by the agreeing parties.

Principal benefits of this arrangement are expected to be speedier paper processing, a cutting of actual contract size, and faster work by negotiating personnel and attorneys. This is another step in the battle against red tape.

Spring Draft Rate Won't Change

Impact of the draft upon industry and education is now officially slated to remain at the present rate—about 50,000 men per month—until May 1. Army has received Defense Dept. approval to draft about 53,000 men in April, but Air Force, Navy, and Marine Corps

Stock Issue for AEC Power

Security & Exchange Commission last week gave the go-ahead signal for further financing of Electric Energy, Inc.

The company is building a plant at Joppa, Ill., to supply power to the Atomic Energy Commission project at Paducah, Ky.

Authorization has been given for sale of an additional \$65 million worth of bonds, to be picked up as investments by two insurance companies.

The insurance companies already hold \$100 million of similar types of securities.

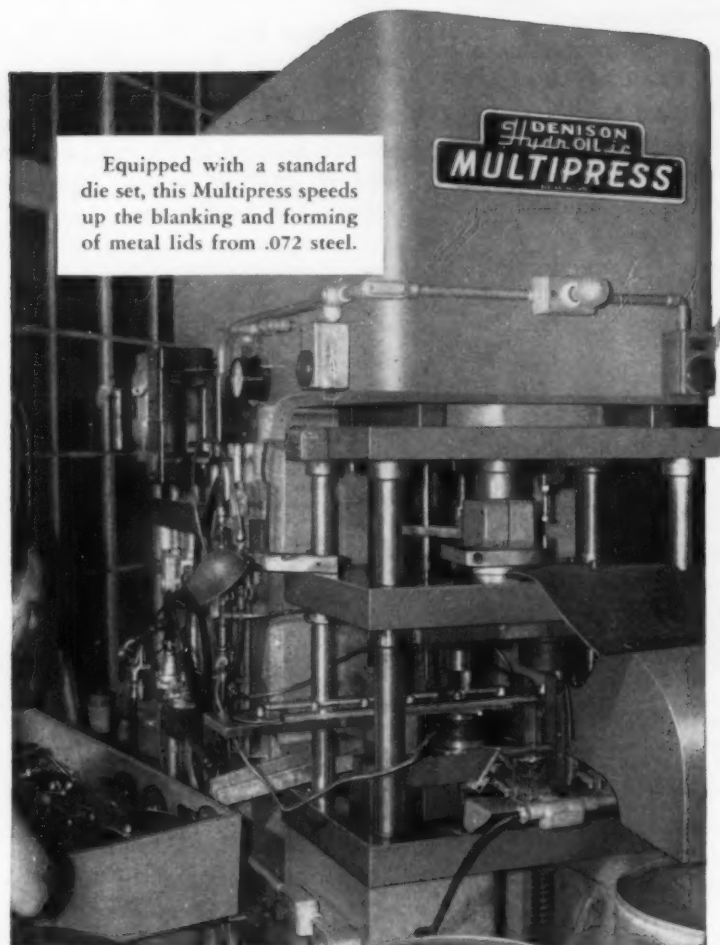
An additional \$2.7 million worth of common stock is to be sold to the parent companies of the power project—Union Electric Co. of Mo., Central Illinois Public Service Co., Illinois Power Co., Kentucky Utilities Co., and Middle South Utilities, Inc.

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West Coast Report

Foundrymen Hit Bottom—Don't Bounce

Industry spokesmen report business volume has dropped sharply since December . . . No change in sight . . . Rising costs cut into profit margin . . . Ford building new plant—By T. M. Rohan.

The bottom has dropped out of Western foundry work in the last 90 days and no rosy future is in sight.

Foundrymen attending the annual California regional conference of the American Foundrymen's Society in Berkeley last week reported business has dropped from two-shift operations last year to less than one shift since December.

Unlike the national picture where there are glimmerings of a revival, no big jobs are hanging fire to indicate an upswing.

Prices have remained constant but in effect have decreased since rising costs have been absorbed. There is little prospect of price cutting due to short finances from decreased sales. Most foundrymen are taking the under-capacity operation period to put their houses in order and do some modernization.

Miss Defense Work . . . The industry in California has been largely bypassed by defense work which is channeled mostly into aluminum, alloys and the other light metals, principally for airplanes. Although Southern California has triple the foundry business of the northern part of the state, foundries have multiplied there so fast that "the men are being separated from the boys" as small operations are forced to close.

California foundrymen's biggest market is in smaller castings for home appliances and equipment such as hot water heaters, space heaters and plumbing fixtures. They attribute the dropoff to slowness in appliance sales since the Korean war "scare buying" ended.

Pent-Up Demand . . . In the heavy farm implement field, farmers who nursed 10-year-old tractors through World War II and had plenty cash bought heavily after the war, especially when the Korean crisis came. Industries, too, bought heavily on shop apparatus and spares, thus skyrocketing sales.

In larger industrial castings, special jobs are available which could be poured but crane capacity is a limiting factor.

Booming western automobile sales have brought increased orders for brake shoes, cylinders and small housings. Larger elements are still shipped from Detroit to western assembly plants, however, so the western business increase has been small.

Scrap Exported . . . First shipment of scrap from California to eastern Canada in recent memory was being loaded in San Francisco last week.



Learner Co. of Oakland, which had a large stockpile of local scrap and some gathered from the Pacific, was loading about 7000 tons, mostly No. 2 bundles, on a low-freight foreign bottom for shipment down through the canal and around to a Canadian steel mill in Sydney, Nova Scotia, at an undisclosed price. Freight will run about \$10 per ton plus \$4 to \$5 per ton loading compared to normal California hauls of from \$4.50 to \$6.25 between Bakersfield and Los Angeles or San Francisco.

Canadian shipments may be made on easily-obtained permits, but Western scrap men faced with clogged local markets have also recently pressed for export licenses to Japan.

New Ford Plant . . . Instead of expanding the Ford assembly plant at Richmond, Calif., near Oakland, as originally planned, a new \$35 million operation twice as big is going up 30 miles south. Ford last week announced production could not be shut down at Richmond for modernization and will continue work at least until the new plant is up in two to three years.

It is improbable the new plant will do any stamping of major body components since widest western made cold rolled sheets are 48 in. Relatively small output would not justify huge investment in presses and dies except by an independent stamping firm, which could order from several auto firms.

Stamp Small Parts . . . Some Los Angeles firms are now stamping minor components such as wheels, hinges, hub caps, and components such as radiators, bumpers, springs, etc., are largely western bought. The Richmond plant, fifth largest U. S. Ford plant at 300 units daily rated capacity, supplies Northern California and the Northwest.

M.T.

When Does a Band Saw Become a Machine Tool?

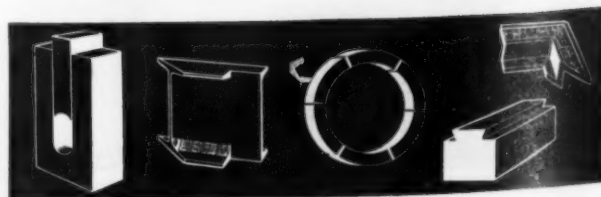
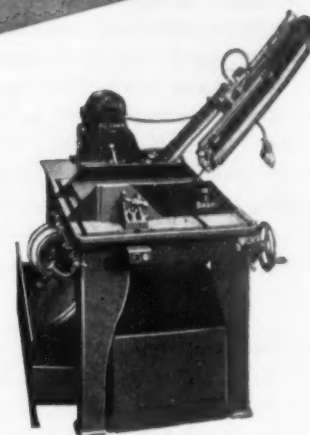
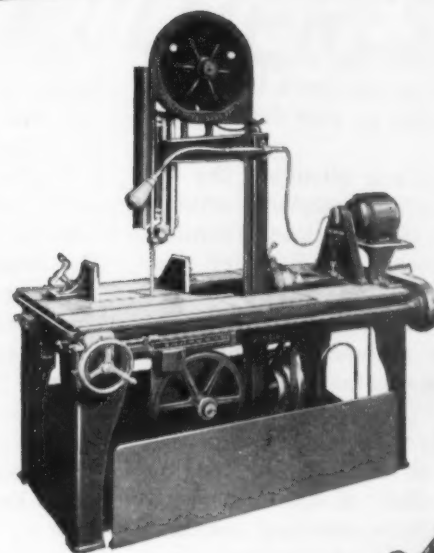
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Diamond Wheel Shortage Looms Large

Increased demand and expected drop in imports threatens "delicate balance" . . . Reserves, inventories low . . . Imports keyed to gem market . . . Try substitutes—By E. C. Beaudet.

Little improvement in the supply of diamond wheels is expected during 1953 because of the increasing deficit of industrial diamonds. Unless more efficient use is made of diamond wheels and salvage measures are stepped up, the potentially acute shortage which now exists may become a reality.

At present there is a delicate balance between supply and demand. Users' orders are stretched out and any disruption of deliveries will hurt. Complicating the problem is the expected increased use of diamond wheels for grinding and sharpening carbide-tipped tools for production.

Expect Rising Demands . . . Last year overall industrial demand for diamonds amounted to 9 million carats. This demand is expected to rise another half million during 1953. Imports of industrial diamonds will be about 1.5 million carats short of this requirement.

This deficit has been made up in past years by conservation, salvaging operations and reserve stocks. However, the deficit is mounting steadily because of increased demand in the face of almost unchanging imports.

Imports Will Drop . . . Imports last year amounted to 7.6 million carats as compared with 6.8 million carats in 1951. However, informed sources predict imports this year will not match the 1952 level.

How much less diamond bort the U. S. will get this year cannot be estimated. But even if imports equal last year's rate this will not be enough to meet the increased demand. If the situation becomes

worse, supply will be restricted to cover only critical needs.

Rely on Surplus . . . Total imports and salvage measures don't add up to the amount required to fill industrial needs. This difference is made up by drawing from surplus stocks.

During the 1930's when use of carbide tools started to spread, more than 50 million carats were held in surplus. At the start of World War II this backlog dropped to about 20 million carats.

In 1951, industry requirements totaled 7.8 million carats. About 6.8 million were supplied through imports, 800,000 from salvage and the remainder from industrial inventories.

Deficit Mounts . . . The deficit became larger in 1952 when 9 million carats were required. About 7.6 million carats came from increased imports, around 900,000 carats from salvage, and almost half a million from industrial reserves. At present these reserves are too low for comfort. Inventories have been depleted and

there are no indications that we can look forward to an increasing supply.

Although American users get the lion's share of available industrial diamonds, regulation of this supply is beyond their control.

Supply of industrial stones varies with the supply of gem stones. When the availability of gem stones is curtailed for market price reasons, industrial diamonds also suffer.

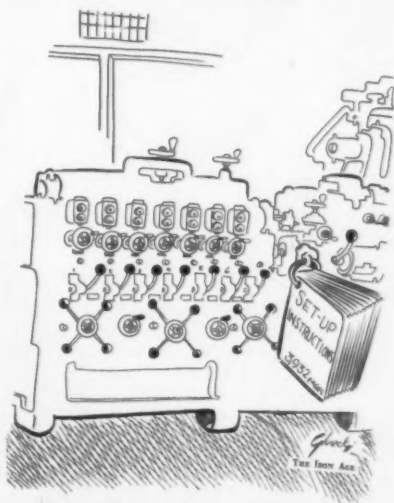
Seek Substitutes . . . This lack of control over supply plus real shortages have spurred American efforts to find substitutes. Since sharpening single point carbide tools accounts for the greatest consumption of diamond bort, research has been concentrated on development of alternatives to diamond grinding.

Among the new processes developed for grinding carbides are the electrolytic, electro-sparking, electro-arc and ultrasonic methods. Some of these processes eliminate the need for diamond wheels in grinding.

Will Be Tried . . . For the most part these methods are still undergoing experimentation. There is as yet no evidence that they are going to achieve widespread industrial use in the immediate future. However, the diamond shortage will assure them a full trial. Greatest stumbling block seems to be in finding a low-cost process.

There is increasing evidence that users are showing more interest in their development as a possible source of relief from the diamond shortage.

To date the most promising fields for application of these new methods seem to lie in the sharpening of single point carbide tools, grinding of single point chip breakers, sharpening milling cutters and broaches and shaping and finishing dies.



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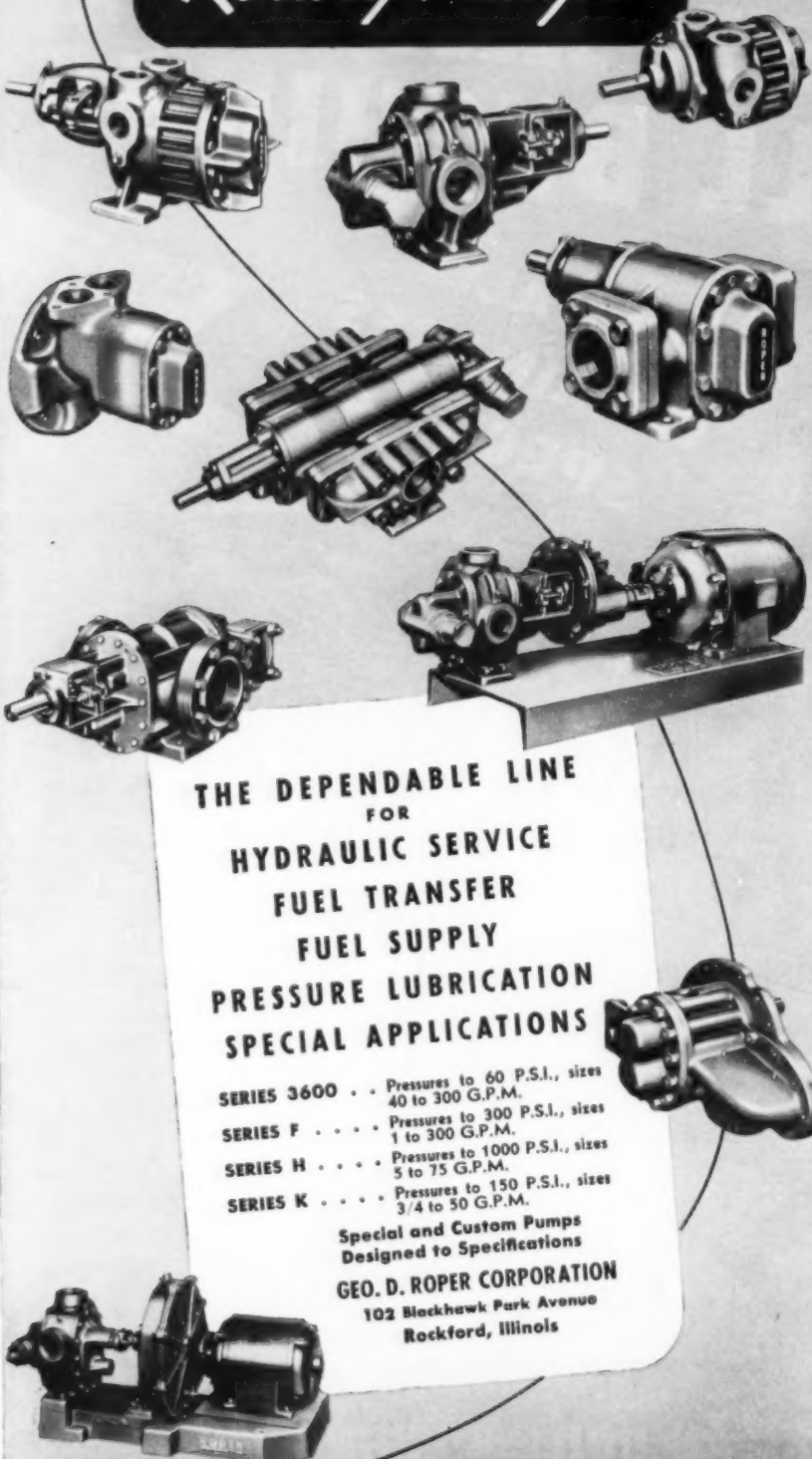
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For free copy circle No. 14 on postcard, p. 106

Carbide tools

A new 12-p. catalog of single point brazed on carbide cutting tools and carbide tips and blanks has been released by DoAll Co. Included in the catalog are straight turning tools for general shop applications, lead angle turning tools, point nose tools, threading tools, end and side cutting offset tools, and square nose tools. *DoAll Co.*

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Abrasives

Cratex Rubberized Abrasives are especially designed for burning, smoothing and polishing operations after dimensional grinding or shaping. They are available in wheel, points, blocks, sticks and cones for machine or hand operations and are made in four standard grit types ranging from relatively coarse to extremely fine textures. More information is contained in a new circular. *Cratex Mfg. Co.*

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Silica removal

Due to its low operating cost, demineralization and silica removal by ion exchange are becoming common practices in industry. A few fields in which the ion exchange method is being used are electroplating, plastic products, nonferrous metals and treatment of waste of many types. *Permutit Co.*

For free copy circle No. 17 on postcard, p. 106

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... you can count on it in every

SIMONDS

"Red End"

Power Hack Saw Blade

It's the *plus* you get in "Red End" Blades that makes the difference in overall performance, cutting life and dependability . . . a *plus* that starts with Simonds extra tough Hack Saw Steel, poured and rolled in Simonds own steel mill . . . followed by proven know-how in milling and setting the teeth and in heat-treating for uniform hardness and toughness of every blade. A choice of three types of job-designed blades in all standard sizes is another *plus* that pays off in extra cut-ability and lower hack saw costs for you. Get delivery from stock from your Industrial Supply Distributor.

THERE'S A RIGHT "RED END"
BLADE FOR EVERY JOB!

HIGH SPEED MOLYBDENUM
— the RED Blade for cutting
mild alloy steels and
general purpose use.

HIGH SPEED TUNGSTEN —
the GREY Blade for cutting
hard alloys and stain-
less steels.

HIGH SPEED WELD-EDGE —
the SHATTERPROOF Blade
for use where maxi-
mum safety is
required.



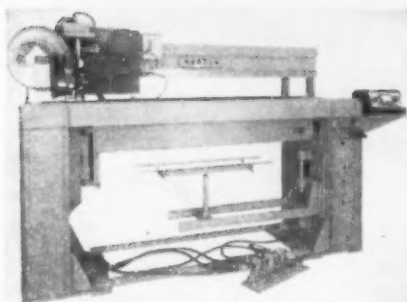
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon. Canadian Factory in Montreal, Que.
Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Simonds Abrasive Co., Phila., Pa. and Arvida, Que., Canada

February 12, 1953

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 103 or 104.

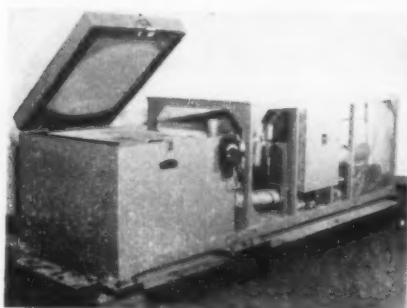


Stake welding machine offers flat clamping

A new type clamping arrangement incorporated in a stake welding machine offers flat clamping with no tendency for seam separation under load. Less operator interference and better visibility are advantages of the machine. The stake, mounted on an air actuated vertical slide, is

supported and aligned at the outer end by a manually operated shoe pin. Interlocking air valves protect the machine from improper operating sequence. A manually operated gage bar is built into the machine. *Morton Mfg. Co.*

For more data circle No. 18 on postcard, p. 103



Cold treatment of metals stabilizes dimensions

A new line of units for the cold treatment of metals have ranges from -50° to -200° F. Cutting tool life can be increased by 500 pct, distortion and cracking resulting from grinding can be eliminated, and dimensions of precision parts, gages and tools are said to be permanently stabilized by the use of these units.

Tests have proved that Bowser cold treatment will improve expansion fitting, salvage out-of-size dies, increase hardness and lengthen life of carburized alloy gear steels, blanking and forming dies and plastic molding dies. *Bowser Technical Refrigeration.*

For more data circle No. 19 on postcard, p. 103

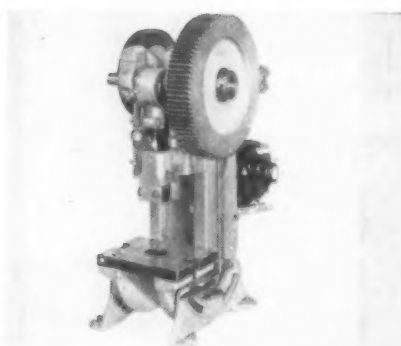


Comparator for inside and outside dimensions

This new horizontal master comparator provides practical high-precision dimensional comparison. Its friction-free sensitivity assures repetitive accuracy that makes possible fine measurement to a high degree. All amplification is accomplished by an electronic circuit. A constant pressure is applied to the sides of the workpiece by each contact at every point of measurement. This pressure is exactly the same for every part inspected. Operator

has a selection of four magnifications: 500:1, 1500:1, 5000:1, and 15,000:1; all on the same meter. The operator can use the same instrument to trace work from rough grind to finished lap with the ease of the setup on low magnification, then quickly switch to high magnification for accurate size determination. Repetitive accuracy is said to be exceptional. *Federal Products Corp.*

For more data circle No. 20 on postcard, p. 103



Punch presses provide powerful stroke

New Benchmaster punch presses, designed for drawing, forming and other operations, provide slow, powerful strokes not obtained on ordinary presses. They have husky, stub-tooth back gears and a reducing speed range of 40 to 100 strokes per min. A single-trip mechanism requires the ram to be triggered for each stroke. Conversion of the ram

stroke to continuous motion is easily done by removal of one screw. The press may be hand fed or fed automatically with one of many friction roll feeds. Back gearing can be had on the 4-ton standard, 4-ton deep throat and $7\frac{1}{2}$ -ton presses. *Benchmaster Mfg. Co.*

For more data circle No. 21 on postcard, p. 103

Turn Page

AMERICAN CHEMICAL PAINT COMPANY

AMBLER



PENNA.

Technical Service Data Sheet

Subject: HOW **GRANODIZING** PROTECTS STEEL DRUM SURFACES FROM RUST AND IMPROVES PAINT ADHESION

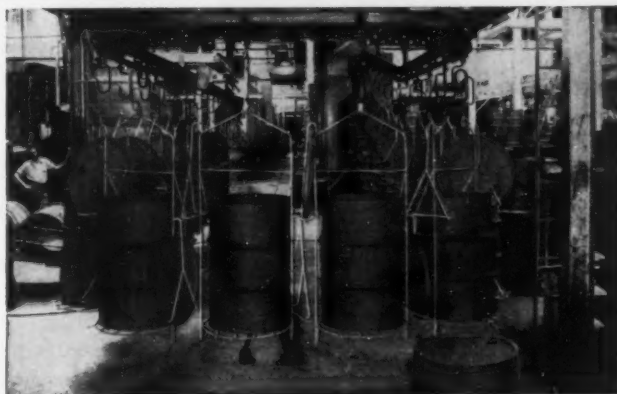
NEW DEVELOPMENT IN CONTAINER INDUSTRY

United States Steel Products Division, United States Steel Company is now producing grease-free, scale-free, rust-inhibited steel drums. A chemically clean metal surface plus a "Granodine" non-metallic zinc phosphate coating insures maximum finish durability and underpaint rust-resistance.



ORDINARY PAINTED DRUM after a year of exposure to weather is badly rusted. Rust was very apparent after only one week.

U. S. S. RUST-INHIBITED DRUM of similar type shows absolutely no rust after same year's test.



Port Arthur, Texas, Cleaning Line

U. S. S. drums about to enter the 400 foot cleaning and treating line. Powerful impingement sprays directed at the fabricated shell, head, and bottom, insure that the entire interior and exterior of the drum will receive full cleaning and rust-inhibiting treatment.

ADVANTAGES OF GRANODIZED STEEL DRUMS

These new phosphate-coated steel drums exhibit many advantages for companies using these containers.

They are chemically clean, "water-break free" inside, free of contaminating residues such as grease, oil, drawing and stamping compounds. When the familiar handkerchief test is applied to United States Steel Products' containers processed by their new finishing technique, no contamination of any kind is left on the cloth.

They are free of mill-scale. United States Steel Products is the first steel drum manufacturer to remove harmful mill scale completely ahead of the zinc phosphate coating stage.

They are rust-inhibited with a zinc phosphate-coating. These new steel drums have the added advantage of a non-metallic, paint-bonding "Granodine" zinc phosphate coating. This has been standard practice for many years in the automotive and appliance industries for long-lasting paint protection and metal preservation.

THE PROTECTIVE CHEMICAL TREATMENTS

The Granodizing process embodies the following steps:

1. Grease and dirt removal
2. Full scale removal, after welding the side seam
3. Zinc phosphate coating with "Granodine"
4. Acidulated rinsing in "Deoxylyte" solution

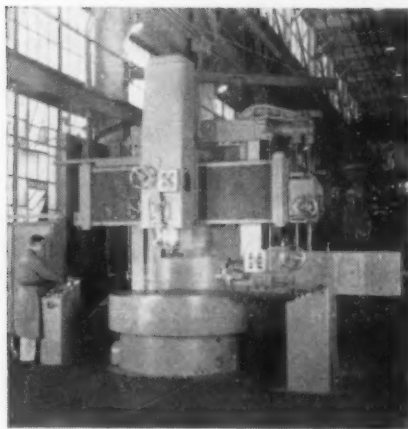


WRITE FOR INFORMATION ON "GRANODINE" AND ON YOUR OWN METAL PROTECTION PROBLEMS



New Equipment

Continued

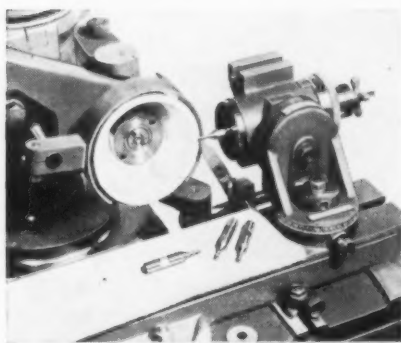


Vertical chucking grinder for larger size work

Combined use of mechanical, hydraulic and electrical components in a new vertical chucking grinding machine provides the accuracy, flexibility, power and ease of operation essential to precision grinding. Table speeds are infinitely variable from creeping to top speed. Grinding spindles travel in either direction, with speeds controlled by 10 hp motor in the main head; 5 hp

for side head grinding spindles. Rate of reciprocation of grinding heads is controlled by a selector dial having twelve, set orifice type valves for metering the flow of oil. Fine feed and dwell can be used together or independently; can be set for the bottom, top or both ends of the stroke. Six sizes of machines are 30, 36, 42, 54, 64 and 74 in. for grinding larger workpieces. *Bullard Co.*

For more data circle No. 22 on postcard, p. 103.



Sharpening attachments for small end mills

Peripheral and end teeth of straight shank end mills from $\frac{1}{8}$ to $\frac{3}{8}$ in. diam are quickly and easily sharpened using new sharpening attachments on No. 5 and No. 10 cutter and tool grinding machines. The sensitive, free-turning spindle is of especial advantage when sharpening very small end mills having steep spiral peripheral teeth. The

tooth being sharpened is held in contact with the tooth rest while feeding the cutter across the wheel by longitudinal table movement. Attachment spindle can be set to an angle in both horizontal and vertical plane with rigid clamping provided for both adjustments. *Brown & Sharpe Mfg. Co.*

For more data circle No. 23 on postcard, p. 103.

A large industrial scrap handling system is shown. It features a wide conveyor belt with a metal grate surface, supported by heavy metal frames and rollers. The system is designed for moving large pieces of scrap metal through a factory.

MAY-FRAN

AUTOMATIC SCRAP HANDLING SYSTEMS

MAY-FRAN

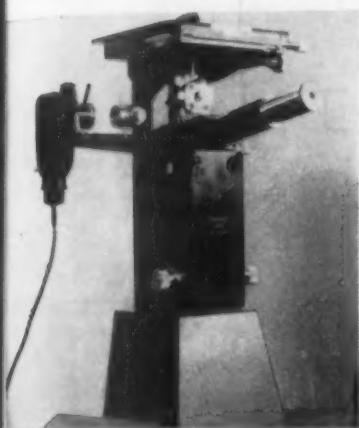
UNIVERSITY OF MICHIGAN LIBRARIES



Rod parter cuts bars without burr or distortion

An improved Di-Acro power rod parter cuts rods and bars speedily and accurately without burr and distortion. A motor driven flywheel has replaced an air operated power unit. The flywheel drive, operating at 180 strokes per min, provides six times the cutting speed previously available. The unit can be installed in any plant

where electric current is available. No need for air pressure lines, compressors, etc. Ejectomatic gage, supplied as standard equipment with the power parter, allows the separate operation of gaging, ejecting and cutting to be performed in a single working cycle. *O-Neil-Irwin Mfg. Co.*



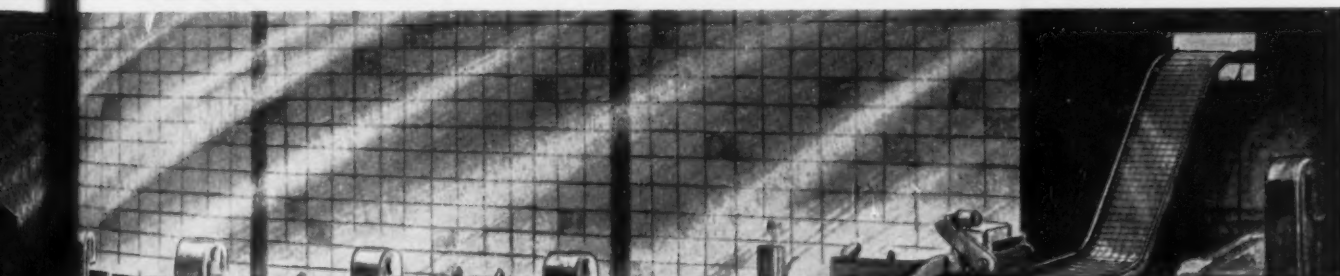
Quick surface inspection of metallic specimens

An inverted metallurgical microscope, Melabor, provides bright and dark ground visual observation. With the instrument, surface inspection of metallic specimens is quick and convenient. Large base with shock absorbers minimizes vibration. When placed on the stage the specimen is automatically aligned perpendicularly to optical axis. Square mechanical stage traverses in two directions with scales and verniers. Coarse focusing is by

rack and pinion; fine adjustment by micrometer screw with 0.0001 mm measuring drum. A low voltage lamp provides the illumination. Optics give magnifications ranging from 40 to 2200X. Changeover from bright to dark ground illumination is instantaneous. Accessories include binocular eyepiece attachment, micro hardness tester. *William J. Hacker & Co., Inc.*

For more data circle No. 25 on postcard, p. 103.

Turn Page



... speed-up production

For full utilization of vital machinery and skilled manpower, mechanize your scrap handling. MAY-FRAN automatic systems increase production by eliminating machine downtime for scrap removal and end manual lifting and hauling.

Whether your scrap volume is large or small, MAY-FRAN can design and install an automatic handling system to meet your needs. Hot, wet or highly abrasive chips, turnings and borings can be re-

moved continuously from operating machine tools by CHIP-TOTE conveyors and transported to disposal point on MAY-FRAN hinged-steel belting.

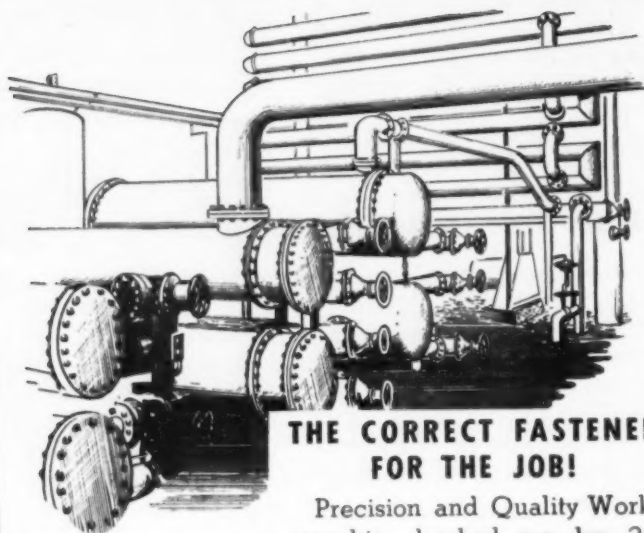
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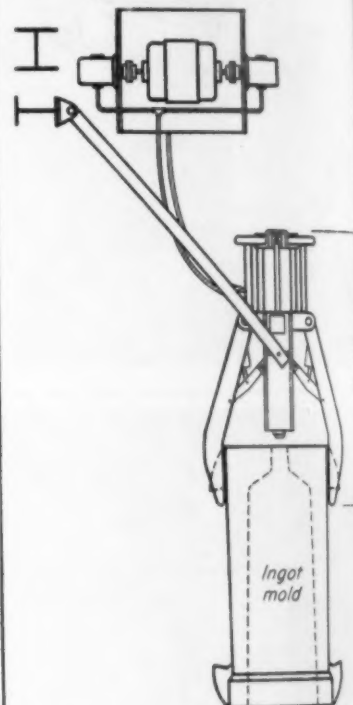
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Vibrating screen

For sizing and processing ore, coal, chemicals, rock and bulk material a new vibrating screen is equipped with heavier yolk to handle heavier loads. It is mounted on coil springs instead of leaf springs. Units have 3-in. discharge lips. Both single and double deck models will be available. The screen employs the circle-throw principle. *Hewitt, Robins, Inc.*

For more data circle No. 26 on postcard, p. 103

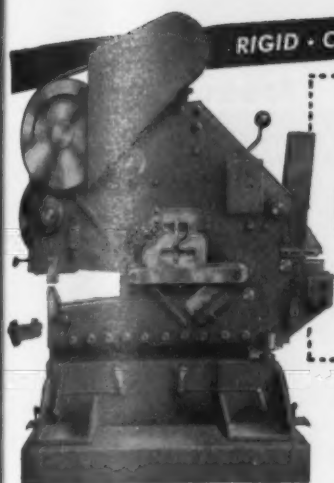
Hydraulic power unit



Ingot stripper

A recent mechanical design, originating at Kendall Engineering Co., is a new portable type ingot strippers that eliminates jarring ingots from molds. As it is self-contained, the machine can be readily swung into position to remove sticking ingots from the molds; when not in use it is swung out of the way along the building column line. An overhead crane is not required for actual stripping. Its portability permits its being moved by lift truck, or similar conveying equipment. It provides an inexpensive machine for the smaller steel producer. *Taylor-Wilson Mfg. Co.*

For more data circle No. 27 on postcard, p. 103
Turn Page



RIGID • COMPACT • EFFICIENT

WORMSER UNIVERSAL IRONWORKER

ARMOR PLATE
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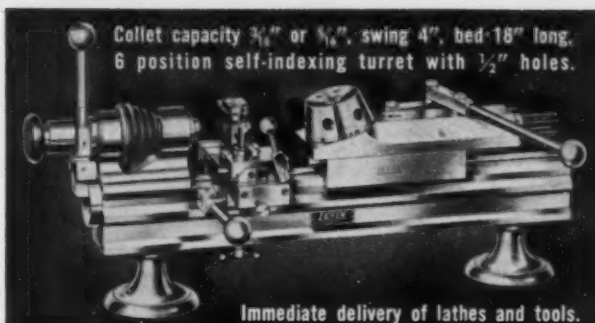
- Rigidly built of high tensile steel
- All gears are machine cut, forged steel
- Flywheel shaft mounted on ball bearings

PARTIAL SPECIFICATIONS	T 15	T 25	T 30
Punch capacity	7/8" x 7/16"	1" x 9/16"	1-3/16" x 1/2" or 1-1/16" x 5/8"
Shears Plates	7/16"	1 1/2"	5/8"
Shears Flats	3-3/16" x 9/16"	3-3/16" x 5/8"	4" x 3/4"
Shears Angles (Square Cut)	3 1/4" x 5/16"	4" x 3/8"	5" x 1/2"
Shears Tees	3 1/4" x 5/16"	4" x 3/8"	4 3/4"
Shears Round	1-13/16"	1 3/8"	1 3/4"
Shears Square	1"	1 1/4"	1 1/2"

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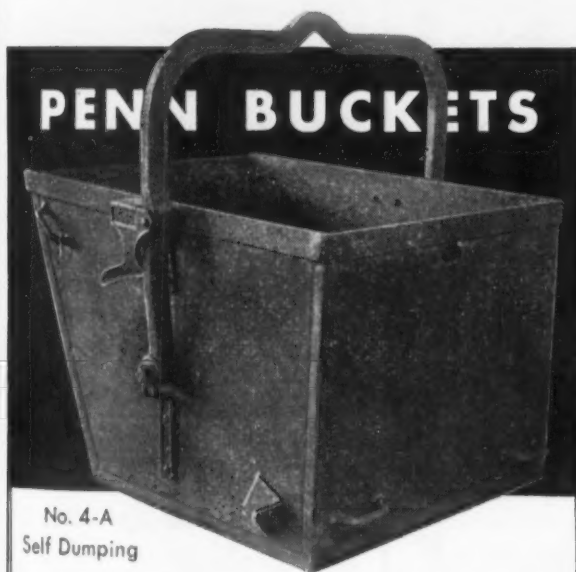
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—New Equipment—
Continued



Infrared meter

A new infrared meter has been designed to measure radiant-energy intensities up to 10 w per sq in. It is especially suited for determining in a matter of seconds the intensity of high-range, radiant energy sources and for studies of infrared radiation effects concerning absorption and transmission properties of materials. The pocket size instrument is inexpensive. The meter need be exposed for only a few seconds when making measurements. *General Electric Co.*

For more data circle No. 28 on postcard, p. 101.

Greaseless composition

New buffing and polishing composition, known as Acme greaseless composition, adheres strongly to the wheel face to form a heavy, fast drying head which does not fly off and remains firm even in warmest weather. The composition features a consistently-sized abrasive; particles of exactly the same size act upon all parts of the work to produce a uniform finish.

Hanson-Van Winkle-Munning Co.
For more data circle No. 29 on postcard, p. 101.

Bushing and sprockets

New interchangeable split tapered bushing makes it possible to use the same size sprockets on shafts from 1/2 to 2 1/2 in. diam in steps of 1/16 in. This eliminates the need to rebores stock sprockets to fit particular shafts. The Shold-A-Grip sprockets are available in sizes 1/2 to 1 1/4 in. pitch. Bushing and sprocket are machine steel and can be case hardened. *Boston Gear Works.*

For more data circle No. 30 on postcard, p. 101.

New rotary broach

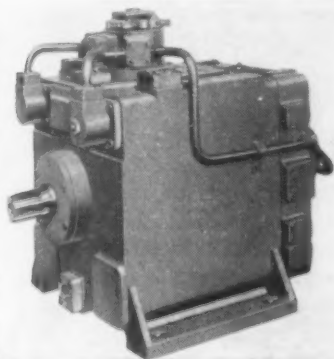
Perfect holes are claimed to be broached with a new Fearless rotary broach. Holes may be finished to an accuracy of ± 0.0001 in. and the final surface finish produced will generally be from 10 to 40 rms. In many instances these tools have eliminated grinding, honing and lapping operations. Rotary broaches remove metal by a true shear-cutting action, which forces the chip being removed ahead of the tool. They are now available from 1/16 to 3 in. in 1/64 in. increments. *Shearcut Tool Co.*

For more data circle No. 31 on postcard, p. 103.

Strippable coating

Capable of cold application by spray, brush or dip method, a new strippable coating is said to be impervious to acids, alkalies, greases and oils and affords good protection against vapors and abrasion. Spray-Strip can be applied to wood or metallic surfaces, dries in 20 min and strips off in a single sheet. *Eagle Chemical Co.*

For more data circle No. 32 on postcard, p. 103.

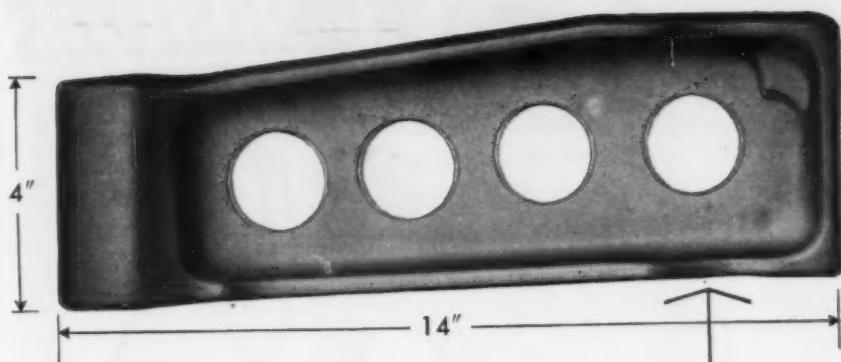


Hydraulic pumps

A new series of heavy-duty commercial and marine hydraulic pumps and motors are suitable for either open or closed hydraulic circuits. Their particular use is for heavy machinery drives requiring precise control of torque, acceleration and deceleration, speed or reversal. The units are available in ten sizes with capacities of 28 to 2300 gpm at rated speeds, and 50 to 4000 hp in the pressure range of 2000 to 3000 psi. *Waterbury Tool Div. of Vickers, Inc.*

For more data circle No. 33 on postcard, p. 103.

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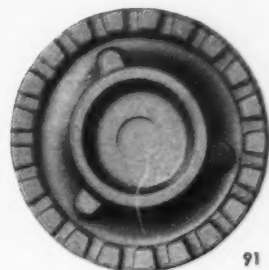


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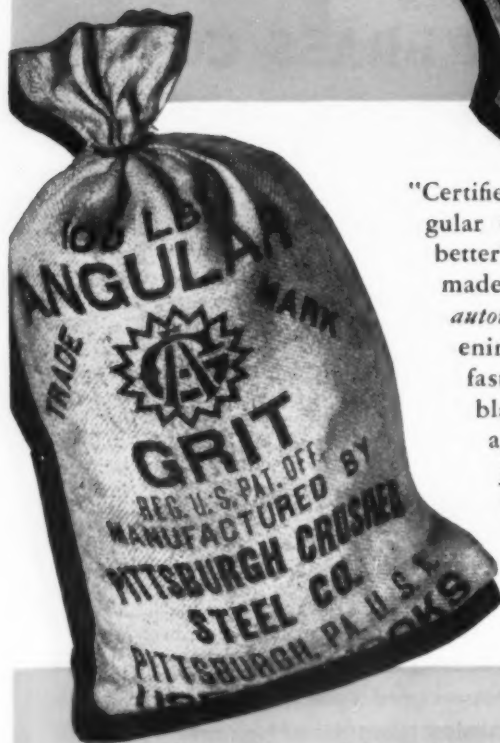
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February 12, 1953

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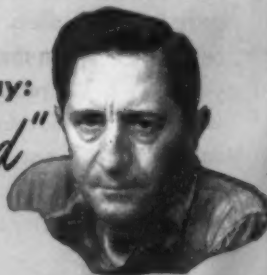


"Certified" Samson Shot and Angular Grit wear longer, clean better! That's because they're made *extra-tough* by a special *automatically controlled* hardening process that assures you fast, efficient, high-quality blast cleaning over and over again. Try "Certified" in your cleaning room and you will discover why it is the *first choice* in hundreds of foundries.

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New Equipment

Continued



Industrial batch ovens

Faster production is claimed for a series of fully automatic, extra heavy duty, industrial type batch ovens. They feature automatic wattage control and balanced heat with temperature range of 100° to 600°F. Automatic wattage control permits the reduction of wattage in relation to temperature and load. Diagonal forced air flow permits heated air to be circulated from both sides, horizontal and vertically. Positive fresh air intake and positive exhaust are standard equipment. *Blue M Electric Co.*

For more data circle No. 34 on postcard, p. 181.

Tapping lubricant

Hypertap, a blind-hole tapping lubricant, is claimed to eliminate tapping operations preliminary to bottoming by its automatic-hydraulic removal of chips from the hole during the thread-cutting operation. This stick lubricant permits the use of finishing or bottoming taps at the start of the thread-cutting operation. *Destiny Products Co.*

For more data circle No. 35 on postcard, p. 181.

Limit switch

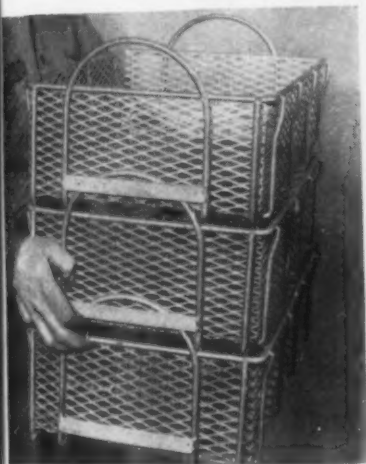
Long life "du.op" limit switch is available with four new types of actuators: heavy-duty nylon plunger; 3-position leaf actuator; ball actuator; stainless steel plunger. Important features are vibration-resistant; capability for very fast switching action; minimum of bounce. It is rated at 20 amp, 125 v ac, non-inductive load. *General Control Co.*

For more data circle No. 36 on postcard, p. 181.

Electrified subfloor

Electrified steel panel subfloor is composed of unit panels which can be welded together in any combination. Each of the panels can be carried easily by two workmen and the strength and smoothness of the sections permit working traffic on the floor during installations. A header duct system developed by National Electric Products Co. has conductors running through the cells of the floor, permitting the installation of electrical outlets in each square foot of space. A butt closure method is used to seal the installed floor. Electrified floor is approved by Underwriter's Laboratories, Inc., National Building Code and the building codes of major U. S. cities. *Detroit Steel Products Co.*

For more data circle No. 37 on postcard, p. 103.



Metal parts baskets

For bulk handling of small parts or in-process storage, expanded metal baskets are made of sturdy steel frames welded to one-piece, pre-formed expanded metal panels. The baskets stack, one on top of another, to save space and facilitate handling. They have comfortable handles for lifting or hand carrying. Flattened expanded metal used in EEZY-STAK baskets is furnished by Wheeling Corrugating Co. in two mesh sizes, $\frac{1}{4}$ and $\frac{1}{2}$ -in. mesh. Baskets are $21\frac{1}{2}$ x $13\frac{1}{4}$ x 6 in.; are zinc plated for rust resistance. *Wire & Iron Products, Inc.*

For more data circle No. 38 on postcard, p. 103.

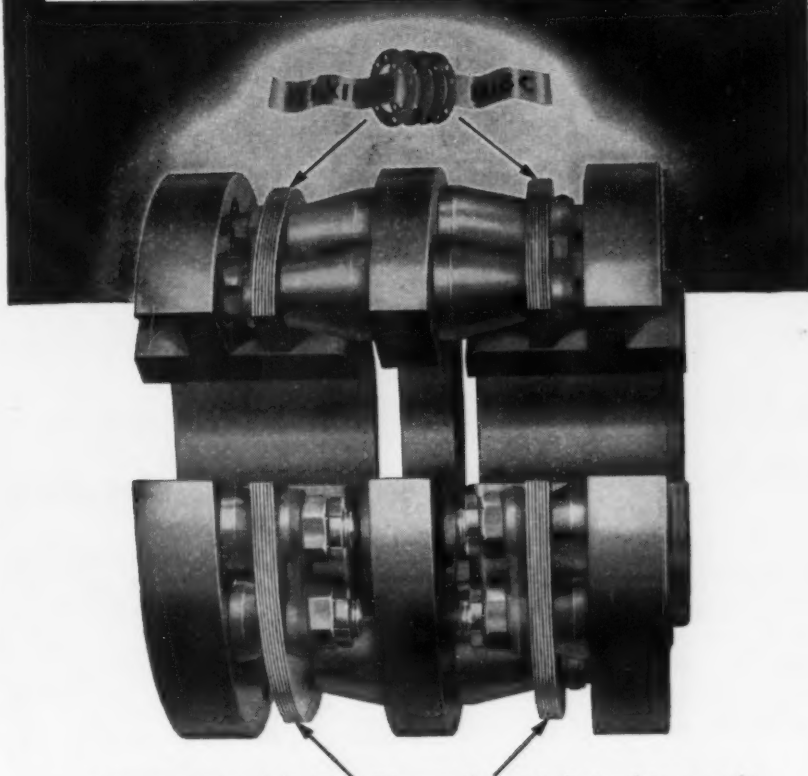
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AVOID COSTLY SHUT-DOWNS!

prolong the life of your machines with Thomas Couplings

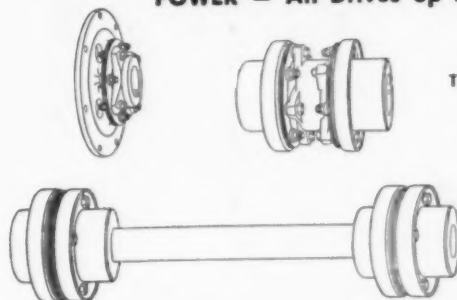
DISTINCTIVE ADVANTAGES of THOMAS ALL-METAL COUPLINGS

GREATEST ECONOMY	No Maintenance Pays for Itself
NO LUBRICATION	No Wearing Parts Human Element Eliminated
NO BACKLASH	All Parts Solidly Bolted No Loose Parts
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

SPEEDS — All Speeds up to 30,000 RPM.
POWER — All Drives up to 40,000 HP.



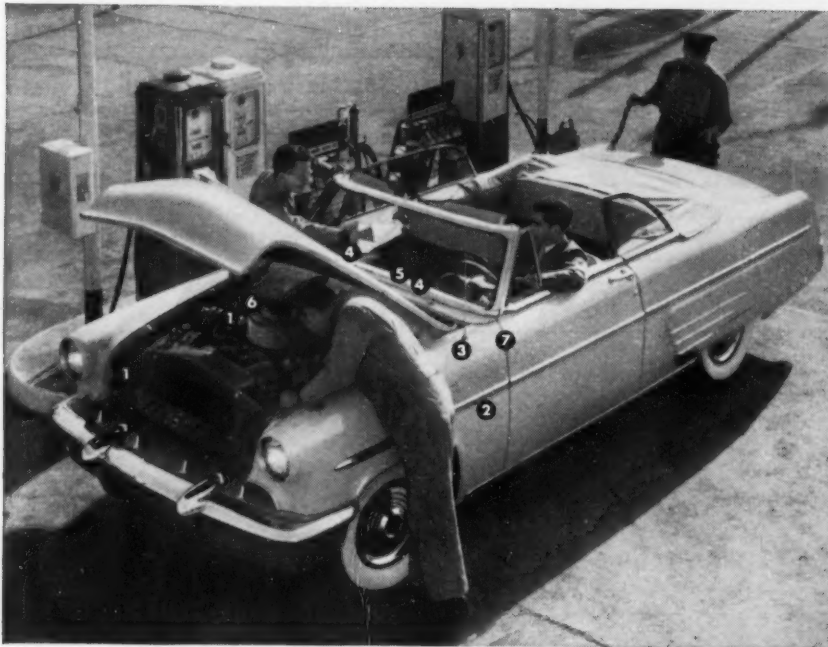
THE THOMAS PRINCIPLE GUARANTEES
PERFECT BALANCE UNDER ALL
CONDITIONS OF MISALIGNMENT.

MANUFACTURERS OF
FLEXIBLE COUPLINGS ONLY
FOR OVER 35 YEARS

Write for our new Engineering Catalog No. 51

THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U. S. A.

METALS



WE EXPECT the motor to roar when we push the starter, the wipers to swish away rain, the heater to pour out warmth. Berylco parts make this possible. For parts and key numbers, see below.

STRENGTH PLUS CONDUCTIVITY

Beryllium copper supplies the automotive industry with reliable low-cost answers

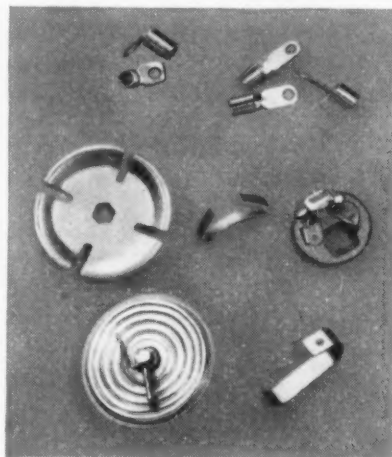
The element beryllium was an 18th century discovery which didn't amount to a tinker's dam until it was alloyed with copper in the 1930s. The result: miraculous. The new alloy retained the good conductivity and corrosion resistance of copper, with the strength and hardness of many steels.

Alert car manufacturers, always on the lookout for reliable materials which will give long life and eliminate costly breakdowns, were among the first to use Berylco beryllium copper. It now appears in many small—but essential—parts of your car. Engineers know these parts will function perfectly for millions of cycles without relaxation or loss of strength or conductivity.

The outlook for expanded use of beryllium copper is extremely favorable. Increased supplies of beryl ore and domestic mining activities will undoubtedly mean (1) the development of new alloys and (2) a substantial addition to the thousands of applications now in use. Manufacturers who would like to take

advantage of this versatile alloy are invited to share the experience and know-how of the world's largest producer. For information, write THE BERYLLIUM CORPORATION, Dept. 3B, Reading 6, Pa.

*Tomorrow's products are planned today
—with Berylco beryllium copper*



Shown here are the Berylco parts numbered in the 1933 car above—a few of the many which help deliver top performance. Reading across, they are (1) wire clips; (2) dimmer switch terminals; (3) antenna raiser; (4) windshield wiper springs; (5) cigar lighter contact; (6) heater control; (7) door switch spring.

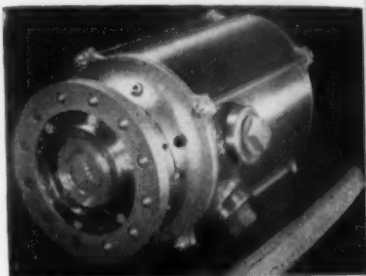
New Equipment

Continued

Televoice system

Industrial Televoice speeds and simplifies in-plant routine and promotes faster, more careful handling and analysis of problems. Described as a plant fact-conveyer, the system deals with conversion of spoken thoughts into written communication by means of a series of special dispatching phones connected to a central recorder. It provides an accurate and rapid means for transmitting essential up-to-the-minute information from production floor to production management in type-written form. *Thomas A. Edison, Inc.*

For more data circle No. 39 on postcard, p. 103.



Water brake instrument

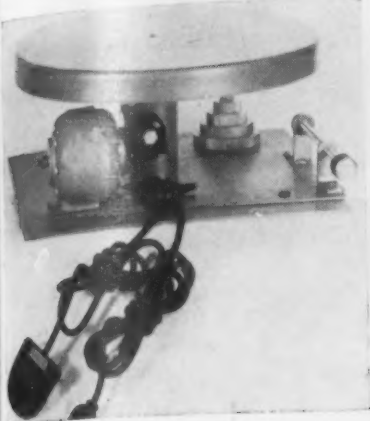
This new water brake type dynamometer for high speed rotary power absorption operates on the heat rise-flow principle. Trade-named Hydra-Brake, the various standard units are compact in size, and designed to absorb power loads as high as 1000 hp. Models having various speed versus load characteristics are available. Standard units range in weight from 35 to 55 lb, with overall dimensions 14 x 10 in. They are mounted directly on the machine under test. *Industrial Engineering Co.*

For more data circle No. 40 on postcard, p. 103.

Accelerometer

Thimble-size accelerometer provides an improved research instrument for the measurement of high frequency shock and vibration. Small size and weight permit testing small components under actual or simulated shock and vibration conditions. It is suitable for missile, aircraft and vibration table measurements; gives a self generated output of 5 millivolts per G. *Endevco Corp.*

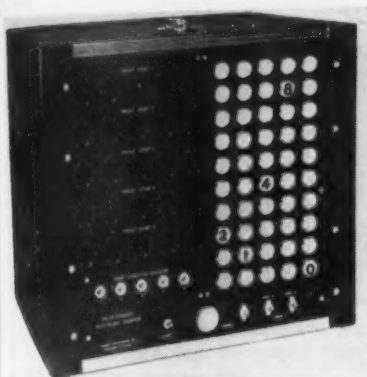
For more data circle No. 41 on postcard, p. 103.



Work positioner

A small, light, variable speed, work positioner has turntable 15½ in. diam, turns by electricity, and safely carries a work load of 300 lb. Operation is continuous or intermittent at speeds adjustable upward from ¼ rpm. It is offered as a bench or pedestal model with accessories to make it inclinable and operable intermittently. *All-State Welding Alloys Co., Inc.*

For more data circle No. 42 on postcard, p. 103.

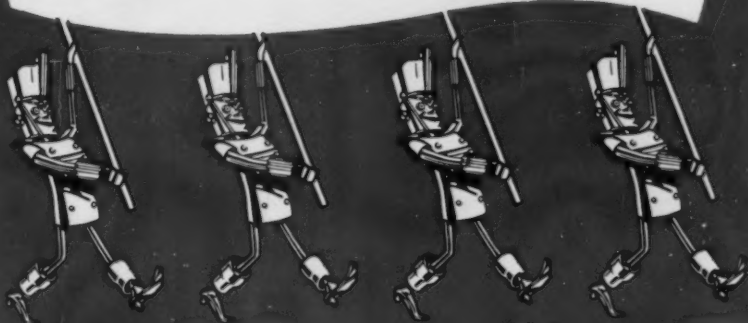


Electronic counter

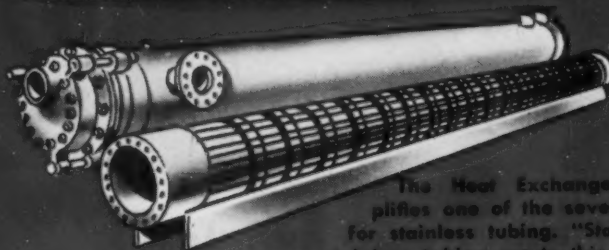
Long life and accurate dependability for industrial and electronic control applications are claimed for an all cold cathode predetermined electronic counter. Simple to operate, these counters are able to produce easy-to-read output information on large illuminated numerals for direct panel readouts without any interpolations or additions for any digit. They operate at any selected count for application to machines or processes requiring exact measurement and control of frequency, quantity, length, time, velocity and revolution. Available for single, dual or multiple sequencing. *Haledy Electronics Co.*

For more data circle No. 43 on postcard, p. 103.

Keep in Step with— RIGID GOVERNMENT TUBING REQUIREMENTS



SPECIFY "Standard" for Welded Stainless Steel Tubing



The Heat Exchanger exemplifies one of the severest uses for stainless tubing. "Standard's" stainless tubing meets this, as well as many other different requirements for strength, and heat and corrosion resistance.

Deal with the Specialist among Specialists

A tubing specialist, like other specialists, knows his trade best.

When you deal with "Standard" you deal with a tubing specialist who manufactures millions of feet of tubing every month from stainless and carbon steel—and for

25 years has been serving all types of industry for mechanical and pressure tubing applications.

If you need stainless tubing, be sure you specify "Standard". It pays to deal with the tubing specialist among specialists.

Stainless Tubing Size and Thickness

¾" O.D. to 3" O.D.
.028 to .095 wall

Carbon Steel Tubing

½" O.D. to 5½" O.D.
.028 to .260 wall



THE STANDARD TUBE CO.

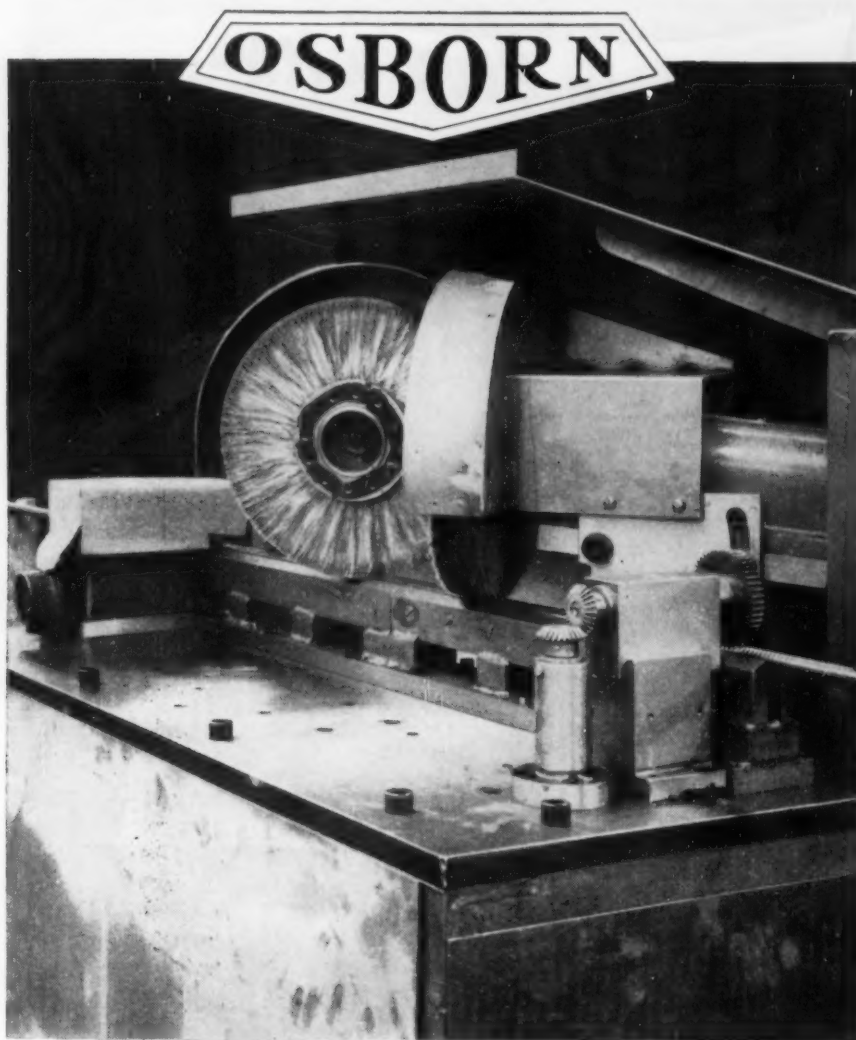
Detroit 28, Michigan

Welded Tubing

Fabricated Parts

STANDARDIZE WITH STANDARD — IN FACT

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Formerly 50 minutes... Now brush-deburred in 6 minutes

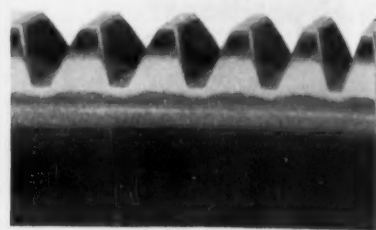
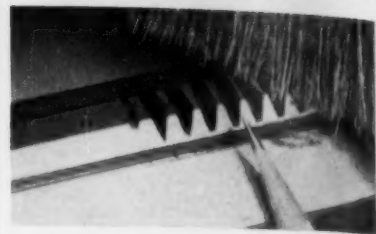
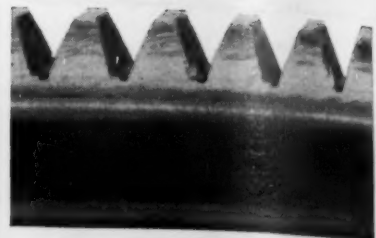
8 times as fast... more uniform deburring... finer surface finish. These are the advantages gained by a large machinery manufacturer with an automatic power-brushing method. The part: a rack gear, 17 ft. long with more than 1000 teeth. The job: light deburring of machine-cut teeth, and blending the junctures of intersecting surfaces to form smooth curves in place of fragile, sharp edges.

With the help of their **Osborn Brushing Analyst**, they devised the machine shown above. This automatically controlled machine with two heads of Osborn Fascut[®] brushes does the entire job in 6 minutes. Burr removal and surface juncture blend are far superior to former methods.

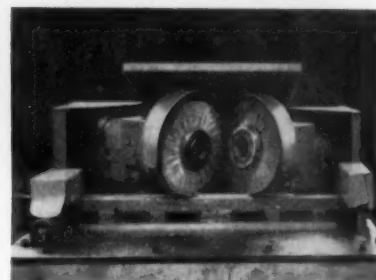
This is typical of thousands of cases where production is being vastly improved with Osborn power brushing methods. Find out how you can cut *your* costs! Call in your **OBA** today or write *The Osborn Manufacturing Company, Dept. F-3, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes®

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES



BEFORE AND AFTER. Top view shows closeup of rack teeth with light burrs and rough surface before brushing by new "push-button" method. Center view shows closeup of rack in machine after completion of brushing. Bottom view shows teeth after brushing. Note uniform surfaces and smooth finish on all teeth.



HOW IT'S DONE. Two rotating Osborn power brushes, engage rack teeth at angles as shown. At push of button, rack drives through machine at about 5 ft. per minute. When the rack completes passage, the drive reverses and sends it back in the other direction. On return travel of part, the direction of brush rotation is reversed to contact surfaces on the opposite side of rack. This gives both sides of teeth uniform brushing.



WHAT'S YOUR PROBLEM? The nearby Osborn Brushing Analyst is experienced in working with machine designers and methods engineers to solve problems with the latest power brushing techniques. Feel free to call him for help!

The **Iron Age**

SALUTES

James F. Lincoln

No do-gooder, his incentive management plan makes his workers among the best paid in the U. S.



BY his own statement Jim Lincoln is no "do gooder." Yet his business philosophy has made the Lincoln Electric Co. in Euclid, Ohio, a multi-million dollar industry whose workers are among the highest paid in the world.

Born on a farm in Painesville, Ohio, in 1883, Jim Lincoln worked his way through Ohio State University as an electrical engineering major. Those were busy days but Jim managed to find time to captain State's football team as a bone-crushing fullback.

He went to work for his brother John in 1907 as a \$50-a-month salesman and took over active management of the firm in 1914. At that time Lincoln Electric had a working force of about 30 men and about 300 square feet of floor space.

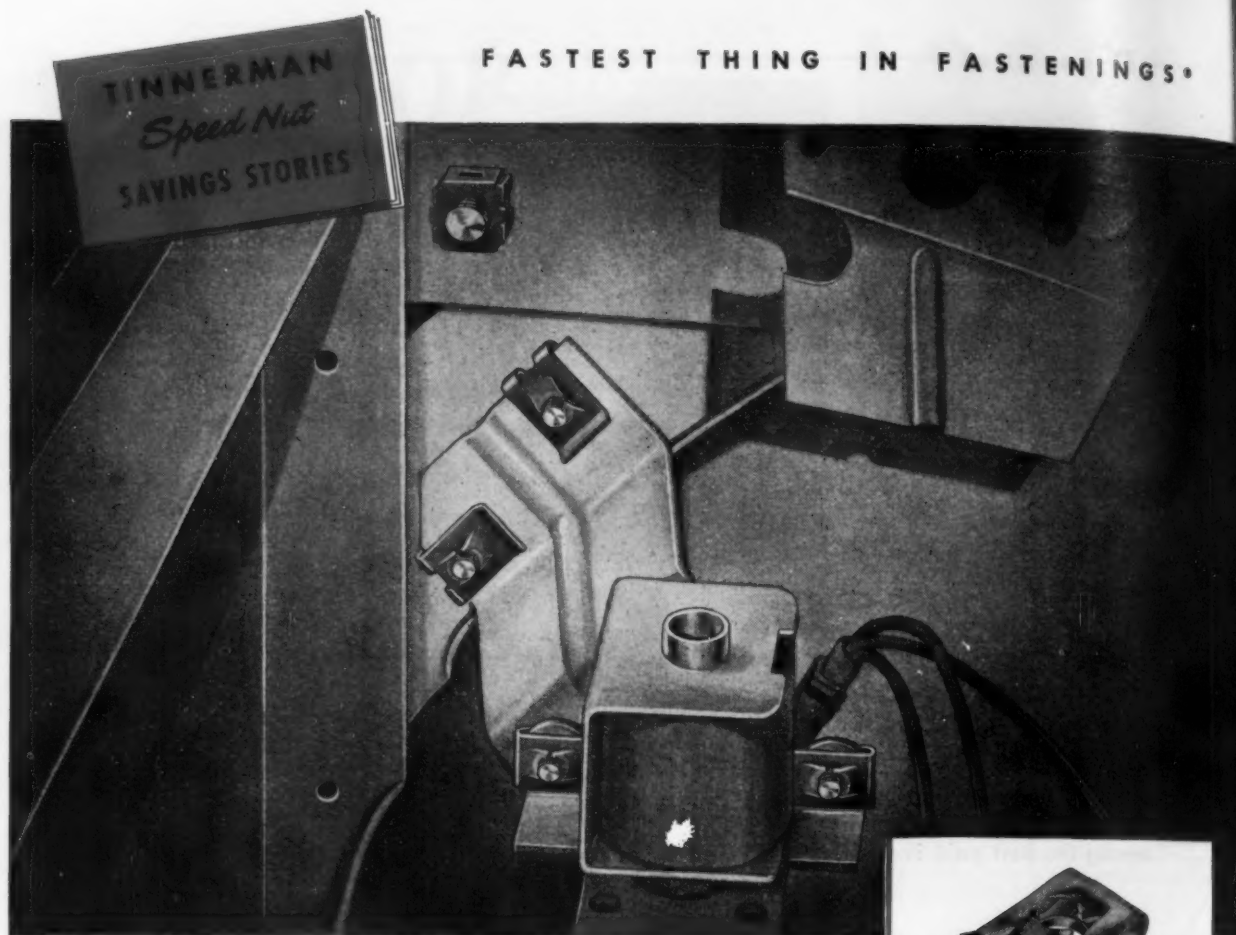
Today the company's new straight line production plant in suburban Euclid covers 20 acres and employs about 1100 workers whose average annual pay runs \$8,000.

Although much has been written about "profit sharing" at Lincoln Electric, Jim Lincoln says it is really incentive management which aims at "producing better and better welding products for more and more people at less cost."

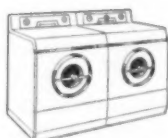
When he isn't keeping in shape by walking or playing handball at Barney Kofron's gym in Cleveland, Jim can be found at the Pepper Pike Country Club where he threatens par by golfing in the low 80's.

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FASTEST THING IN FASTENINGS.

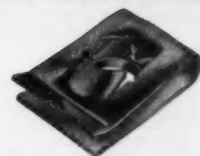


BENDIX Perfect Laundry Pair "Cleans Up" with SPEED NUT Savings!



For years, Bendix engineers have relied on SPEED NUTS to cut assembly costs and step up production schedules. That is why SPEED NUT brand fasteners were specified on the new "Perfect Pair" automatic washer and dryer units.

Here is a direct quotation from a recent Bendix report . . .
". . . because we design from the ground up with Tinnerman, we effect basic economies. These include lower production costs and greater efficiency that result in lower retail prices and reduced service costs for consumers. Thus, in our production, we consider Tinnerman products more basic than nuts and bolts." Chances are your Tinnerman representative can turn your assembly problems into production savings. See him soon for details on the Fastening Analysis Service available for your products!



U-TYPE SPEED NUTS are self-retaining, snap in place over panel edges or center-panel locations; remain in bolt-receiving position for fast, easy assembly.



SPEED GRIP Nut Retainers snap in place by hand . . . no welding, clinching or staking. They reduce materials handling and are ideal for blind locations.

A copy of "SPEED NUT Savings Stories", an interesting booklet of typical Tinnerman savings to industry, is yours on request. Write: TINNEMAN PRODUCTS, INC., Box 6688, Dept. 12, Cleveland 1, Ohio. In Canada: Dominion Fasteners Ltd., Hamilton, Ontario. In Great Britain: Simmonds Aerocessories, Ltd., Treforest, Wales. In France: Aerocessaires Simmonds, S. A.—7 rue Henri Barbusse, Levallois (Seine).



TINNEMAN

Speed Nuts

MORE THAN 8000 SHAPES AND SIZES



The Iron Age

INTRODUCES

Robert M. Nichols, elected president and treasurer, GREAT LAKES PRESSED STEEL CORP., Buffalo; J. J. Wallace, elected vice-president and secretary; and G. Adolphson, elected chairman of the board and will also be available as consultant.

W. B. Boyer, elected treasurer, REPUBLIC STEEL CORP.; and Harold L. Farling, named chief metallurgist, Cleveland district steel plant.

Herbert J. Niemann, appointed vice-president in charge of sales, HYDRO-BLAST CORP., Chicago; P. C. Will, named vice-president in charge of engineering; W. F. Gamble, made secretary-treasurer; and John W. Watson, becomes chief production engineer.

Richard S. Adler, promoted to vice-president in charge of sales, VIKING STEEL CO., Cleveland.

John W. Snyder, elected vice-president in charge of finance, WILLYS-OVERLAND MOTORS, INC., Toledo; and Gerry E. Lyons, made vice-president in charge of sales.

John W. Scallan, promoted to vice-president and general manager, PULLMAN-STANDARD CAR MFG. CO., a subsidiary of Pullman Inc., Chicago; and George L. Green, made vice-president.

G. G. Crewson, named director of engineering, BUFFALO ELECTRO-CHEMICAL CO., INC., Buffalo; J. N. Vermilya, becomes chief engineer; and Charles M. Standart, appointed assistant to chief engineer.

Reynold C. MacDonald, named superintendent of blooming and structural mills, KAISER STEEL, Oakland, Calif.; Gordon A. Zwissler, becomes division superintendent, rolling; and C. A. MacIlvaine, made assistant controller.

William P. Hill, promoted to assistant to vice-president, Steel Div., BETHLEHEM STEEL CO., Sparrows Point Plant; John S. Marsh, named assistant chief of research; and John K. Killmer, becomes chief metallurgist.

A. Kingsley Ferguson, appointed vice-president in charge of industrial engineering WALTER KIDDE CONSTRUCTORS, INC., New York.

Ray P. Johnson, named director of sales research, BORG-WARNER CORP., Chicago; and Alonzo B. Knight, made administrative assistant to the president.

Robert L. Fitzsimons, appointed metallurgical engineer, JESSOP STEEL CO., Washington, Pa.

Charles Sawyer, elected director of KENNECOTT COPPER CORP.

Peter Budd Tursi, named chief metallurgist, THE RIVERSIDE METAL CO., Riverside, N. J.

Robert W. Mason, named superintendent and plant metallurgist, ENGINEERING CASTINGS, INC., Marshall, Mich.

Dr. Cyril G. Veinott, named consulting engineer, RELIANCE ELECTRIC & ENGINEERING CO., Cleveland.

Joseph L. Mullin, named first vice-president, American Manganese Steel Div., AMERICAN BRAKE SHOE CO.

Don W. Blend, promoted to division director of operations, Detroit divisional headquarters, CALUMET & HECLA COPPER CO.

Michael Burtyk, appointed superintendent, new Scarborough Works, Toronto, ACME STEEL CO.

O. W. Acheson, appointed manager of manufacturing, LAMSON CORP., Syracuse, New York.



HARLOW H. CURTICE, elected president, General Motors Corp., New York.



GILFRY WARD, named president, American Manganese Steel Div., American Brake Shoe Co.



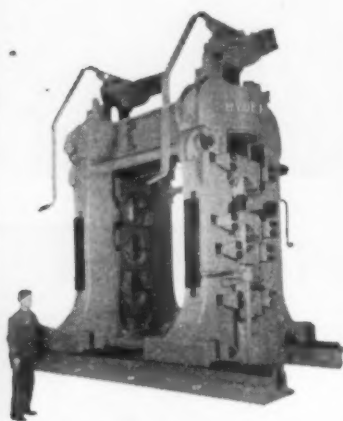
A. DONALD KELSO, becomes vice-president in charge of foreign operations and a director, Norton Co.

Hyde Park



Rolling Mill Equipment

Outstanding in quality and in performance Hyde Park Rolling Mill Equipment has enjoyed the respect of the industry for more than fifty years.



Bar Mills
Merchant Mills
Sheet and Strip Mills
Pinion Stands
Roller Tables
Reduction Drives
Stretchers Levellers
Guillotine Shears
Sheet Mill Shears
Roll Lathes
Special Machinery
Machine Work

Hyde Park

FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.

ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

Personnel

Continued

Robert Griffin, promoted to general superintendent, Aviation Div., THE BINGHAM-HERBRAND CORP., Fremont, Ohio.

John H. Phelan, appointed midwest sales engineer, AGET-DETROIT CO., Ann Arbor, Mich.

William Hagel, appointed to board of directors, UNITED ENGINEERING & FOUNDRY CO., Pittsburgh; and Maurice P. Sieger, also elected to board.

Marcus W. Keyes, appointed sales engineer, Fiber Glass Div., PITTSBURGH PLATE GLASS CO.

Arthur F. Erwin, appointed manager, Atomic power section, ALLIS-CHALMERS MFG. CO., and Edward F. Brill, appointed chief engineer.

Arthur H. Kapnick, appointed manager, Adrian, Mich. plant, AMERICAN CHAIN & CABLE CO., INC.

George S. Bond, promoted to sales manager, Metals & Ceramics Div., P. R. MALLORY & CO., INC., Indianapolis.

James J. Bryan, appointed plant manager, Detroit Div., DETROIT HARVESTER CO., Toledo.

John W. Weaver, named sales manager, Casting Div., WAUKESHA FOUNDRY CO., Waukesha, Wis.

Angus M. Brown, manager of Commercial Sales, LAMSON CORP., Syracuse, N. Y. has taken on the additional duties of manager, Billmyre Blower Div.

S. J. Stowell, appointed merchandise manager, KOLD-HOLD MFG. CO., Lansing, Mich.; and Robert W. Saxton, named sales manager, Contract Div.

Robert J. Stevens, appointed sales manager, Multiwall Div., CHASE BAG CO., Chicago.

Lewis M. Fulton, appointed acting general manager, CANADIAN TUBE & STEEL PRODUCTS, LTD., Montreal.

John E. Griffith, named assistant chief industrial engineer, JONES & LAUGHLIN STEEL CORP., Pittsburgh.

John V. Eakin, appointed assistant general manager, Fawick Airflex Div., FEDERAL FAWICK CORP., Cleveland; Clement Reeves, named sales manager; and K. R. Spelman, becomes assistant sales manager.



JOHN JEPSON, appointed vice-president, Norton Co., Worcester.



HERBERT D. EUWER, appointed chief engineer, passenger cars, American Car & Foundry Co.

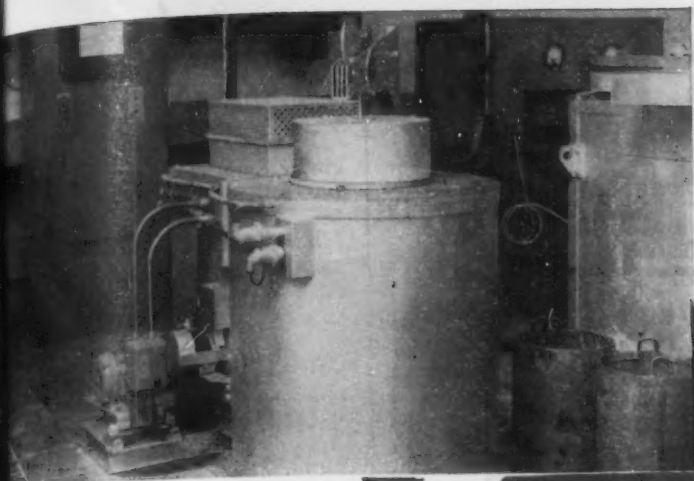


H. J. ZILSKE, promoted to chief engineer, Hydraulic Power Div., The Hydraulic Press Mfg. Co.



EDWARD C. KENT, appointed manager of industrial relations, Acme Steel Co.

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LINDBERG IN *France*

La Compagnie Singer in Paris is but one of the many manufacturers throughout the world who use Lindberg heat treating furnaces. At the Singer plant, high speed tools are hardened in Lindberg "Hydrying" furnaces*. And tempering is handled in Lindberg "Cyclone" tempering furnaces*... utilizing the famous forced convection heating principle.

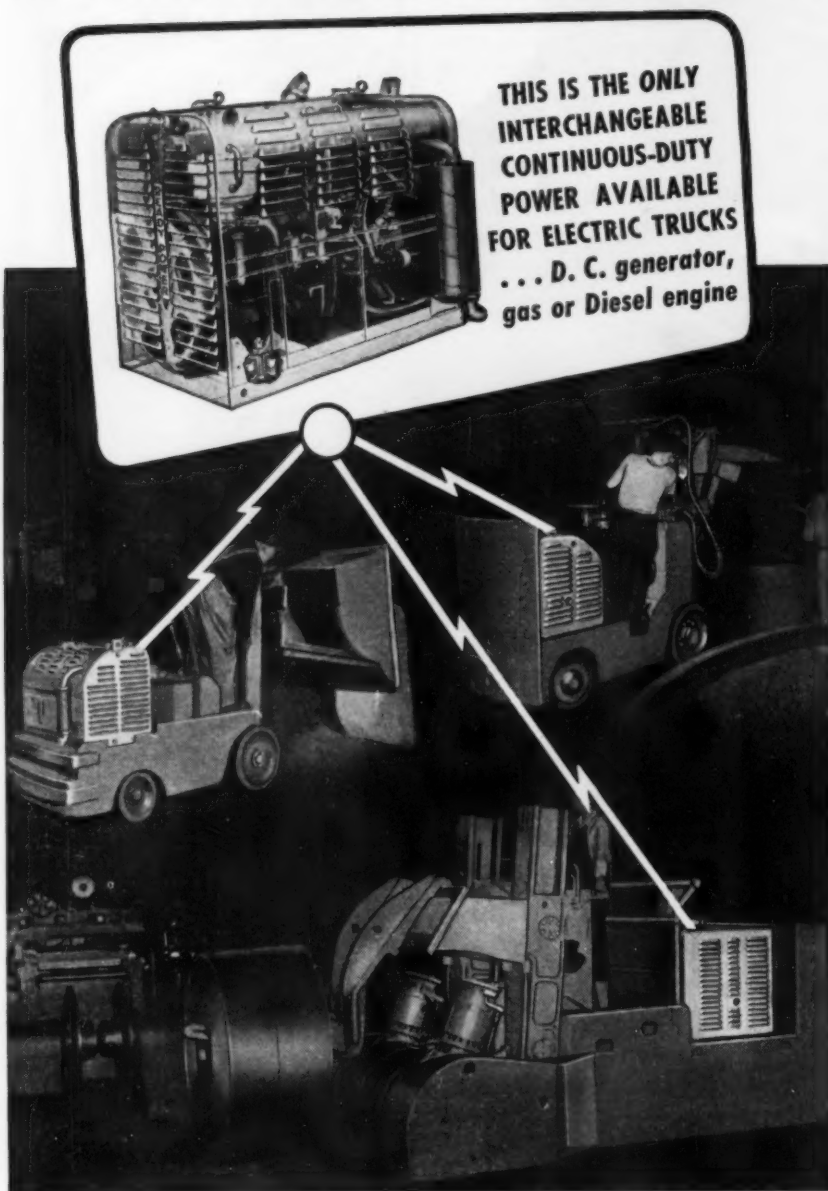
For details and "case history" information contact your nearest Lindberg representative.

*Built under license by Etablissements Jean Aube, Paris, France.

LINDBERG FURNACES

LINDBERG ENGINEERING COMPANY
2452 West Hubbard Street, Chicago 12, Illinois

Ready-Power Adds 'GUTS' to Electric Truck Performance



Only Ready-Power Drive gives electric trucks the stamina that means *full power all the time!* With no limit to hours of service, Ready-Power-equipped trucks handle the toughest jobs at lowest costs per ton-mile. Gas-electric and Diesel-electric models are available for ALL sizes of electric trucks.



Remember...Your Truck Is No Better Than Its Power!

The READY-POWER Co.

3822 Grand River Ave., Detroit 8, Michigan

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

Personnel

Continued

T. F. Boyle, appointed works engineer, Fabricated Steel Construction Div., BETHLEHEM STEEL CORP.

L. A. Watts, named general manager of sales, Eastern Div., THE COLORADO FUEL & IRON CORP., New York.

Gaither Littrell, appointed public relations director, ROSAN, INC., Newport Beach, Calif.

Clarence C. Chmura, appointed sales manager, HENRY E. GREMP CO., Chicago.

Thomas G. Povey, named assistant sales manager, Vertical Dept., REMINGTON RAND, INC., New York.

John C. Pangborn, Jr., appointed Hagerstown district sales manager, PANGBORN CORP., Hagerstown, Md.

L. E. Ritter, named sales engineer in charge of St. Louis office, F. J. STOKES MACHINE CO., Philadelphia.

Jack W. Rembe, appointed sales manager, RODNEY HUNT MACHINE CO., Orange, Mass.

James L. Ragland, appointed manager, new branch in Rome, Ga., FAIRBANKS CO.

H. L. Cahan, appointed district representative, Construction Materials Div., GENERAL ELECTRIC CO.; Raymond B. Elmendorf, named manager-marketing, Construction Materials Conduit Products Dept.; and Leiland D. Whitescarver, named manager of marketing, Medium Steam Turbine, Generator and Gear Dept.

Robert L. Pierce, appointed assistant sales manager, Pittsburgh District, JONES & LAUGHLIN STEEL CORP.

Charles W. Hunter, named general superintendent, Air Frame Div., HUDSON MOTOR CAR CO., Detroit.

OBITUARIES

Harry G. Porch, 79, retired manager of sales in the Boston, office, of Lukens Steel Co., Coatesville, Pa., at his home in Reading, Mass.

Thomas S. Green, 66, a former director of Norton Co., Worcester, recently in Albany.

Tailors for industry—

Transfer-type Machine Tools STANDARDIZED

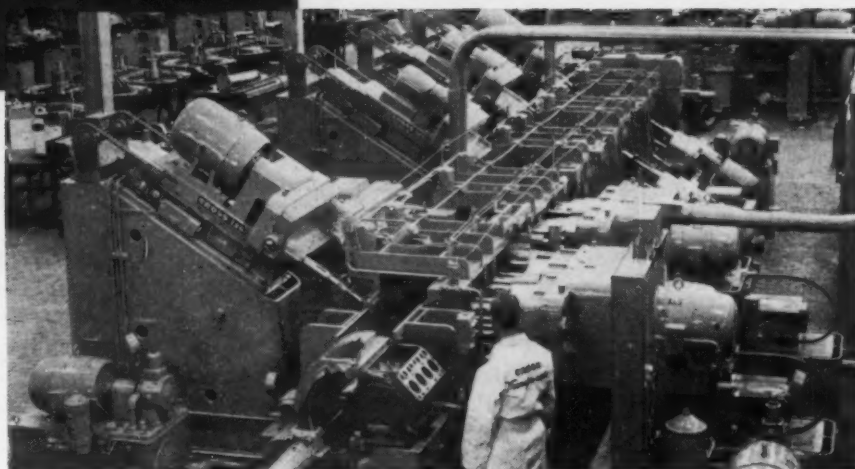


FIG. 1—Motor blocks, transmission housings and other rigid, uniform structures employ plain transfer-type machines for high production. Tools contact the work from many angles and even from the top, if necessary.



By W. G. Patton
Assistant Technical Editor

♦ **HIGH-PRODUCTION MULTI-STATION MACHINE TOOLS** of the transfer and indexing types are generally referred to as "special machine tools," but 70 pct or more of the components of these machines may be standard equipment.

Most of the Transfer-matic machines recently built by The Cross Co., Detroit, utilize more than 65 pct standard equipment, including standard wing bases, standard feed units, standard hydraulic drillers, standard spindles, idler gears and drive gears, standard pumps, motors and electrical equipment.

To understand the emphasis on standardization, it may be helpful to examine some of the reasons given in the table why even special machine tools must inevitably become highly standardized.

Standardization starts logically with a brief description of the major factors that may influence overall design of the modern multi-station machine and follows through the entire engineering and construction process.

The Cross Co. believes special multi-station machine tools can be classified conveniently into four broad types: (1) plain Transfer-matic, (2) pallet-type Transfer-matic, (3) dial or in-

♦ Standardization is one of America's greatest industrial weapons . . . Even tailor-made equipment like the big, high-production transfer machines used in the auto industry are highly standardized.

♦ About 70 pct of the components on special machine tools are standard . . . These include wing bases, feed units, spindles, gears, pumps and electrical equipment.

♦ Another interesting point: Standardization permits re-use of equipment with a change of product.

♦ Present trend toward standardization will definitely continue . . . Flexibility of design will improve performance.

"Standardization really begins in the designing room . . . Feed unit is a major component . . ."

dexing-type machines, (4) trunnion-type machines.

Selection of one general type over another depends on a number of factors including: (1) production rate, (2) shape and rigidity of the part, (3) number and location of operations to be performed and the rate of metal removal, (4) possibilities for holding the part during machining, (5) available floor space, (6) operating cost, and (7) capital cost and amortization schedule.

Relatively uniform structures like motor blocks and transmission housings on which several accurate locating points are available will employ plain transfer-type machines where high production is required, Fig. 1. An advantage is that the part can be worked from both sides, at many angles and even from the top if necessary. Various devices can be used to turn the casting 90 or 180°.

The Transfer-matic pallet-type machine in Fig. 2 carries a rigid plate or pallet on which the part to be machined can be mounted. This type machine lends itself particularly to irregularly-shaped parts that may not be too rigid.

Manifolds are a good example. In this type machine there is no relocating or reclamping.

A dial or index-type machine, Fig. 3, with an accurate index table is generally advisable where the number of stations is somewhat less than in the case of the transfer-type machine. Also, the part is generally smaller.

The trunnion-type machine, Fig. 4, permits working simultaneously on two sides of the part and occasionally on the third side. As in the dial-type machine, the number of stations is limited and the number of operations that may be performed is restricted.

Standardization really begins in the designing room. Through the years, The Cross Co. has developed more than 1000 of their own standards. All phases of machine tool design are now covered by standards. In actual practice, about as many standard parts as a builder of standard machine tools, with the obvious exception of special heads, special mountings for standard feeds and other necessary departures from regular designs are used.

The feed unit, Fig. 5, is one of the major components of all four types of multiple station machines. Standard cross-feed units are built in four sizes and are suitable for milling, drilling and boring operations. The saddle on the unit provides rapid advance, coarse feed, fine feed, dwell, rapid return and stop for the tools. Feeds are independently adjustable and provide an infinite number of combinations. Jump or skip feeds are available with special dog arrangements.

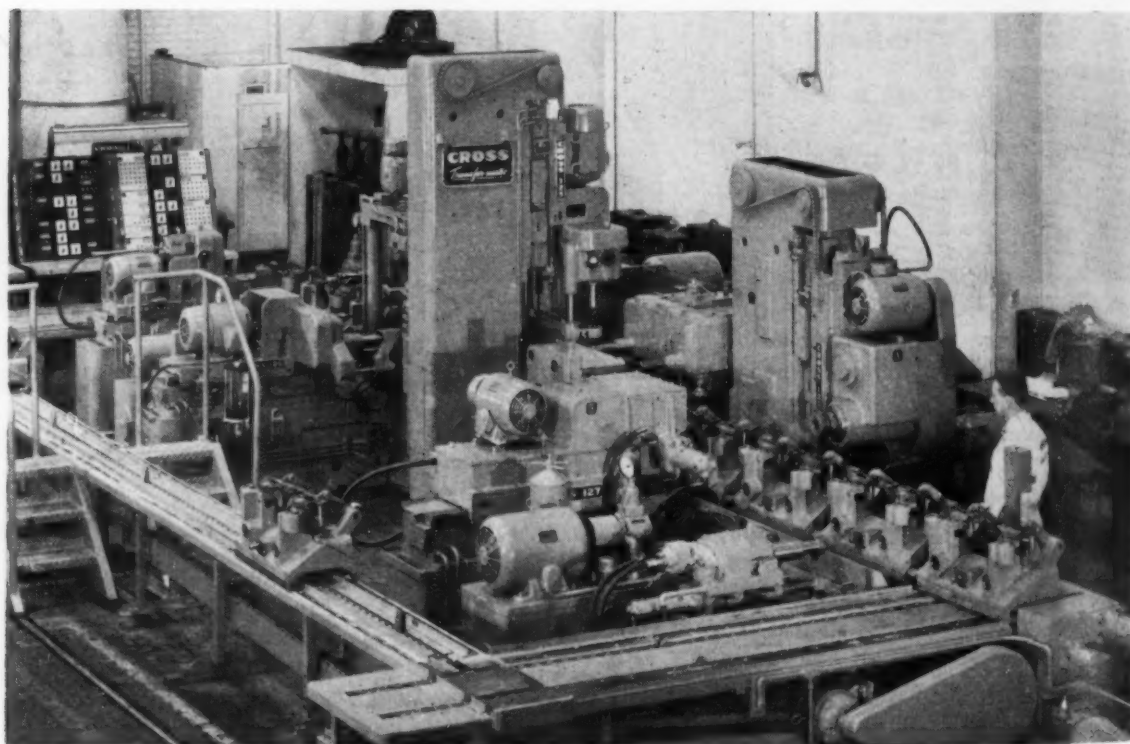


FIG. 2—Pallet-type Transfer-matic machines built by Cross are designed to handle non-rigid, irregularly shaped parts.

This machine is designed for exhaust manifolds. No relocating or reclamping is necessary.

A standard single spindle hydraulic driller, Fig. 6, has been developed as a useful component for multi-station machines. It features heavy-duty construction for high production, and a longer-than-average stroke so that tools can be changed without interfering with the work. It is used for a variety of drilling operations in out-of-the-way locations and for angular holes where multiple heads are not required.

Feed units and the hydraulic drillers are supported on wing bases and columns in horizontal, vertical, and angular positions. Horizontal wings and vertical columns are standard. Angular wings and columns are standard in design and vary only in the amount of angle from vertical or horizontal. Wing bases are carried in stock with about 95 pct of the machine work complete; the balance is to individual order.

Dial-type machines are built around a standard power-driven index table, which is made in three different sizes: 36 in., 48 in., and 60 in. The index table is supported by a base of standard design. Feed units surround the table to do the cutting. The number of stations, also the number and location of the feed units, is arranged to suit the application. In final form, the only special items on the dial-type machine are the work-holding fixtures and the special tool heads. But even the special heads have many standard working parts.

The pallet type Transfer-matic, Fig. 7, like the dial-type machine, is built with many standards. The pallets are standardized in length and width. A standard, self-contained unit has been

developed to locate and clamp the pallets in the machining stations. The distance between stations is standardized, making it possible to use standard base sections and standard transfer mechanisms. Fixture conveyors for carrying the pallets from the last machining station to the loading station are also standard. A hydraulic power wrench, Fig. 8, has been developed and standardized for operating the clamps for the work holding devices.

Included in the long list of mechanical de-

WHY STANDARDIZE?

1 Standardization is the direct approach toward the reduction of engineering and construction costs.

2 Repeated experience with standard units contributes to the reliability of these machine tools in service.

3 Standardization simplifies maintenance and reduces downtime—an important requirement for high-production machine tool.

4 The time required to fill an order has been greatly reduced as a result of standardization.

5 As a result of standardization, each machine built contributes to the successful design of the next machine.

6 New design ideas can be introduced in an orderly manner.

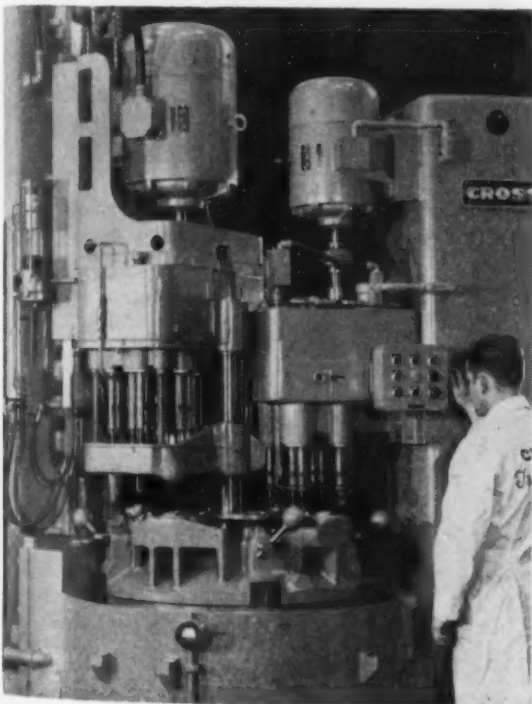


FIG. 3—Dial or indexing-type machine is shown here. The number of stations is limited in this type machine; also, the part is generally small such as flywheel shown.

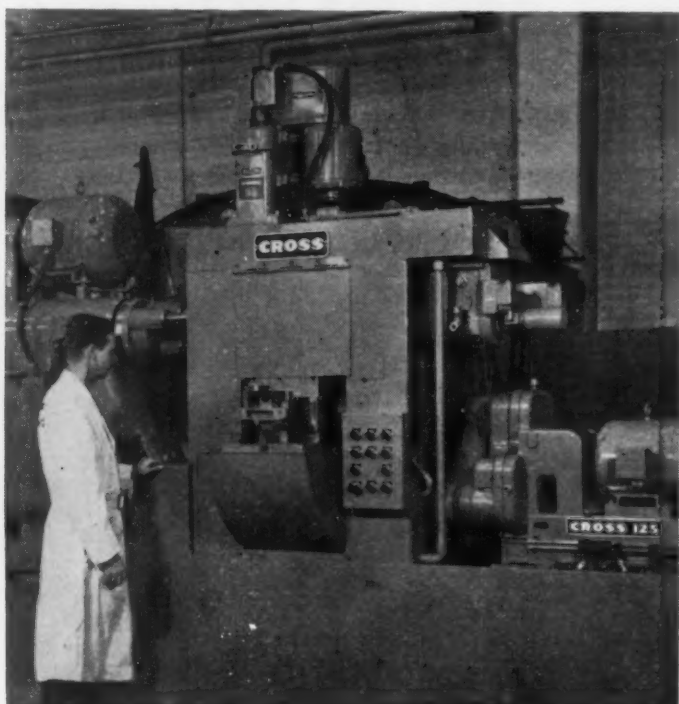


FIG. 4—A trunnion-type, high production special machine permits simultaneous operation on two sides of a part and occasionally on the third side

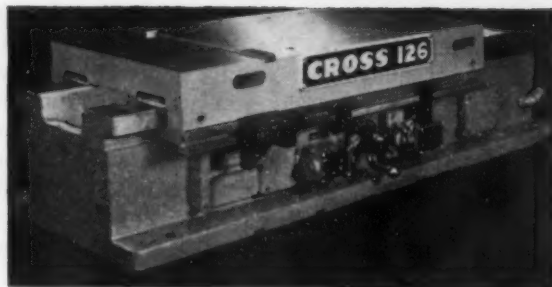


FIG. 5—Standard cross feed units such as the one shown here are major components on all types of Cross machines.

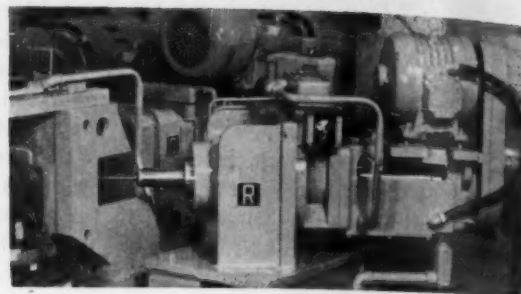


FIG. 6—Single-spindle hydraulic driller has been developed for drilling in out-of-the way locations.

tails of special machines that are now standardized are spindles, gears, bearings, tool holders, tool shanks, drill bushings, drive shafts, input shafts, oil gages, oil filters, hydraulic pumps, hydraulic fittings, counterweight mechanisms, etc.

All Cross Machines are built to Joint Industry Conference Electrical Standards. In addition, other standards that simplify design and improve maintenance have been developed. In control panels, the starters and relays are arranged in logical sequence to tie in with the operation of the machine.

In any section of the control panel, each vertical row contains all controls for a single feed unit. Except for starter sizes, these groupings are identical. This arrangement simplifies design and facilitates maintenance because the same relay of each group performs the same function. A panel controlling 20 units is handled as 20 identical circuits, each containing six or seven pieces of equipment, rather than a large complex panel involving more than 100 pieces of scattered apparatus.

Hydraulic designs also follow JIC Standards. Valves, cylinders, piping and cylinder mountings are all standardized. On special cylinders, components such as pistons and packings are also standard. Steel manifolds replace piping wherever possible.

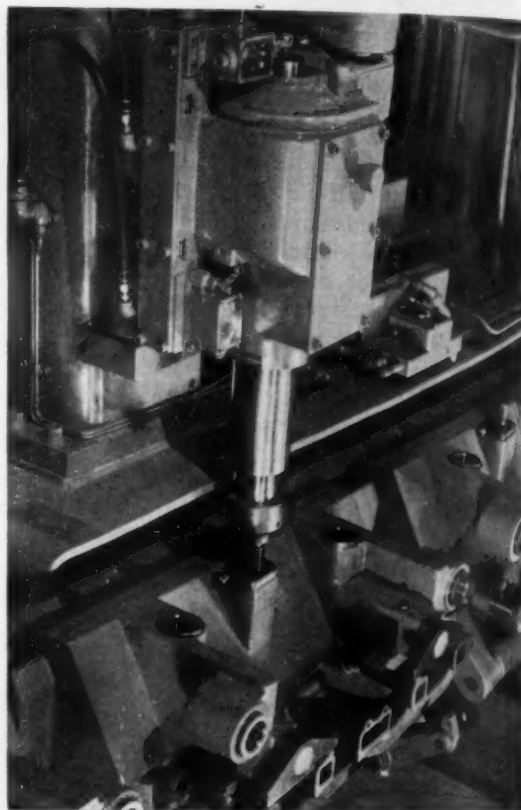


FIG. 8—Hydraulic power wrench has been standardized to operate the clamps for the work holding devices.

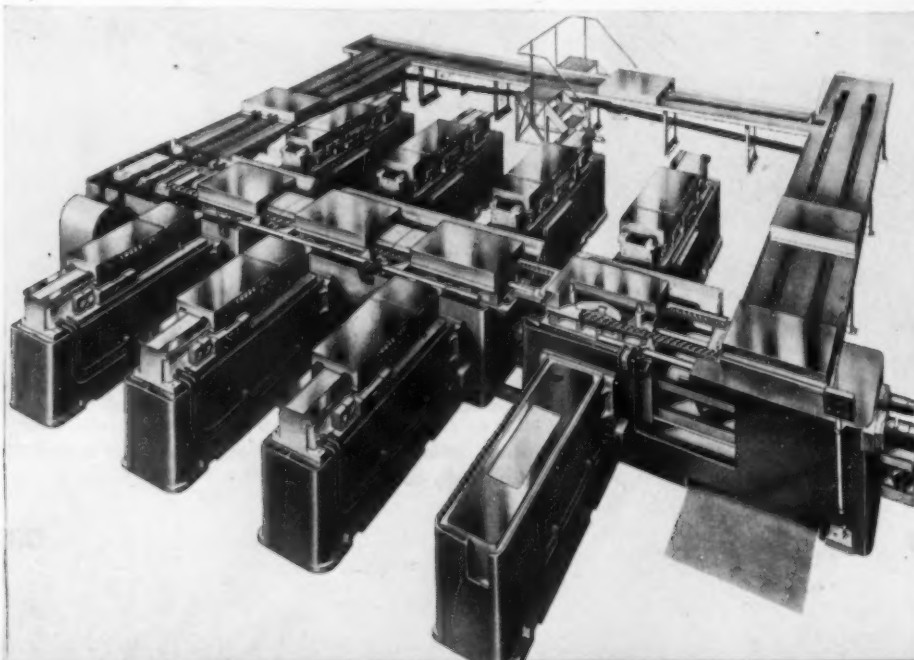


FIG. 7—Use of standard parts in a pallet-type Transfer-matic are illustrated here. The table and clamping device are standard; also the transfer devices.

The working idler—

Convert to Belts for LOWER POLISHING COSTS

By J. J. Durnan

Product Engineering Dept.
Behr-Manning Corp.
Troy, N. Y.



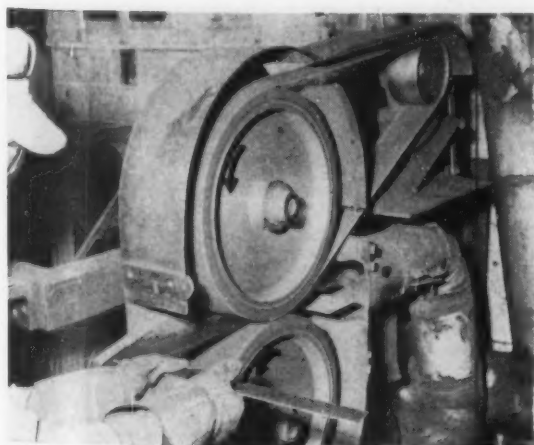
Conversion of polishing lathes from setup wheels to belt grinding is simple with the aid of backstand idlers. These versatile units are ideally suited to many grinding and polishing operations. They are used with a variety of backing wheels and factory-coated belting. They make available to every shop the advantages of cooler, faster grinding at lower cost per piece.

♦ **POLISHING LATHES** can be simply and inexpensively converted from headed or set-up wheels to modern coated abrasive belts. Belt, backstand idler and contact wheel needed for a trial setup cost less than \$100. They make available, at low cost, the polishing and finishing advantages of abrasive belts.

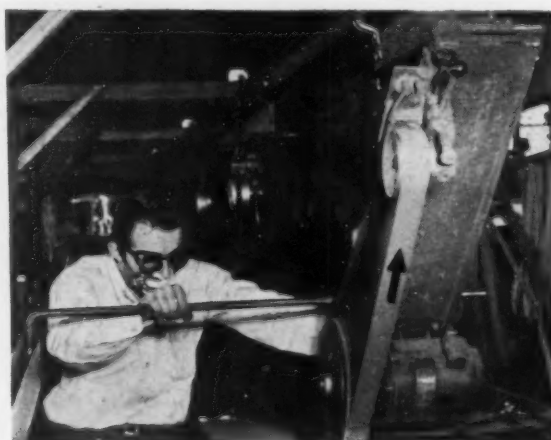
Wild grain marks, chattering and burned spots often cause work rejections when set-up

wheels are used. Better cutting action and faster, more uniform stock removal are possible with electro-coated belts. The controlled, even-cutting surface permits cooler cutting with less operator effort. Belts do not shed as set-up wheels do and maintain a sharp cutting surface many times longer.

The polishing lathe is converted by mounting the idler on floor or wall directly behind



BOTH SIDES of flat metal part are polished simultaneously. Idler for bottom wheel is floor mounted. Wheels rotate in opposite directions to reduce drag.



WELDS ARE EASILY GROUND with this traveling swing grinder. Dust protected motor and backstand idler are mounted on hinged base. Unit travels on monorail.

"Idler unit provides belt tension and automatic takeup and keeps belt in alignment . . ."

the contact wheel. The idler unit provides belt tension and automatic take-up and keeps the abrasive belt in alignment over the contact wheel. Face width of the idler may vary according to the abrasive belts used.

Spring tension, counter weighted and air tension idlers are commonly used. The spring tension bench type idler is least expensive and, at present, the more versatile. Pedestal

mounted idlers are usually stronger and better suited to heavy duty production installations. The air tension idler maintains a more constant and accurately controlled belt tension than do the simpler spring and weighted designs.

In changing a polishing lathe to a coated abrasive belt polisher, belt speed in surface feet per minute, type of contact wheel, and type of idler should be checked.

Recommended belt speed depends on the material being polished and the finish desired. Speeds range from 4000 sfpm for relatively soft metals to 10,000 sfpm for heat-treated steel. Most polishing lathes have variable speed controls but on constant-speed lathes,



FREE AND CLEAR area below grinder is gained by mounting idler on rear wall. Chain and rack holder ease job of polishing heavy contoured parts.

OPERATING DATA FOR BETTER GRINDING

Operation		Sand Cast Aluminum	Die Castings	Brass	Bronze	Cast Iron	Steel Cold-rolled Hot-rolled
Remove Sprues Gates Risers	Type belt Grit range Belt speed, sfpm Contact Wheel Durometer Contact Wheel Face	Silicon Carbide 24-40 75-8500 70-90 Serrated		Aluminum Oxide 36-60 7500-8500 60-90 Serrated	Aluminum Oxide 36-60 7500-8500 60-90 Serrated	Silicon Carbide 36-60 4000-5000 70-90 Serrated	
Rough Grinding	Type belt Grit range Belt speed, sfpm Contact Wheel Durometer Contact Wheel Face	Silicon Carbide 50-100 7500-8500 70-90 Serrated	Aluminum Oxide 80-150 6500-8500 70-90 Serrated	Aluminum Oxide 60-90 6500-7500 60-90 Serrated	Aluminum Oxide 60-90 6500-7500 60-90 Serrated	Silicon Carbide 36-60 4000-5000 60-70 Serrated	Aluminum Oxide 80-150 6500-7500 70-90 Serrated
Medium Grinding	Type belt Grit range Belt speed, sfpm Contact Wheel Durometer Contact Wheel Face	Silicon Carbide 120-180 6500-7500 40-60 Serrated	Aluminum Oxide 180-240 5000-7500 30-60 Plain	Aluminum Oxide 120-150 6500-7000 40-60 Serrated	Aluminum Oxide 120-180 6500-7500 40-60 Plain or Serrated	Silicon Carbide 60-120 4000-5000 40-60 Serrated	Aluminum Oxide 80-150 6500-7500 40-60 Serrated
Finish Grinding	Type belt Grit range Belt speed, sfpm Contact Wheel Durometer Contact Wheel Face	Silicon Carbide 220-320 5000-7500 10-30 Plain	Aluminum Oxide 240-320 5000-7500 10-40 Plain	Aluminum Oxide 180-240 6500-7500 10-30 Plain	Aluminum Oxide 180-240 6500-7500 10-30 Plain	Silicon Carbide 120-180 4000-5000 30-40 Plain	Aluminum Oxide 180-240 6500-7500 10-30 Plain

belt speed can be varied by using contact wheels of different diameters. On belt driven spindles, changing shives will correct the speed. This speed, in surface feet per minute, can be determined by the formula:

$$\text{sfpm} = \frac{\text{rpm} \times \text{wheel diam in in.} \times 3.1416}{12}$$

12

Abrasive belts are generally backed up by compressed canvas wheels, bias type buff contact wheels, rubber face contact wheels and leather, felt, cork, etc. For roughing, the hard wheel is used. For general work and better finish a softer wheel is recommended.

Working conditions usually dictate where the idler is mounted. Belts should wrap around the contact wheel through at least a 90° arc before reaching the work contact point. Where possible, belts should travel down and away from the point where grinding is done. Shape and size of parts to be polished as well as floor arrangement of equipment also determine how the idler should be installed.

For heavy rough grinding special lifting fixtures are often required. Idlers are often mounted on the wall behind the polishing jack and above the center-line of the contact wheel. More floor space is available under the polishing belt for handling the work. Working point is about 180° from where the belt first meets the contact wheel. This helps eliminate belt slip from side to side as pressure is exerted

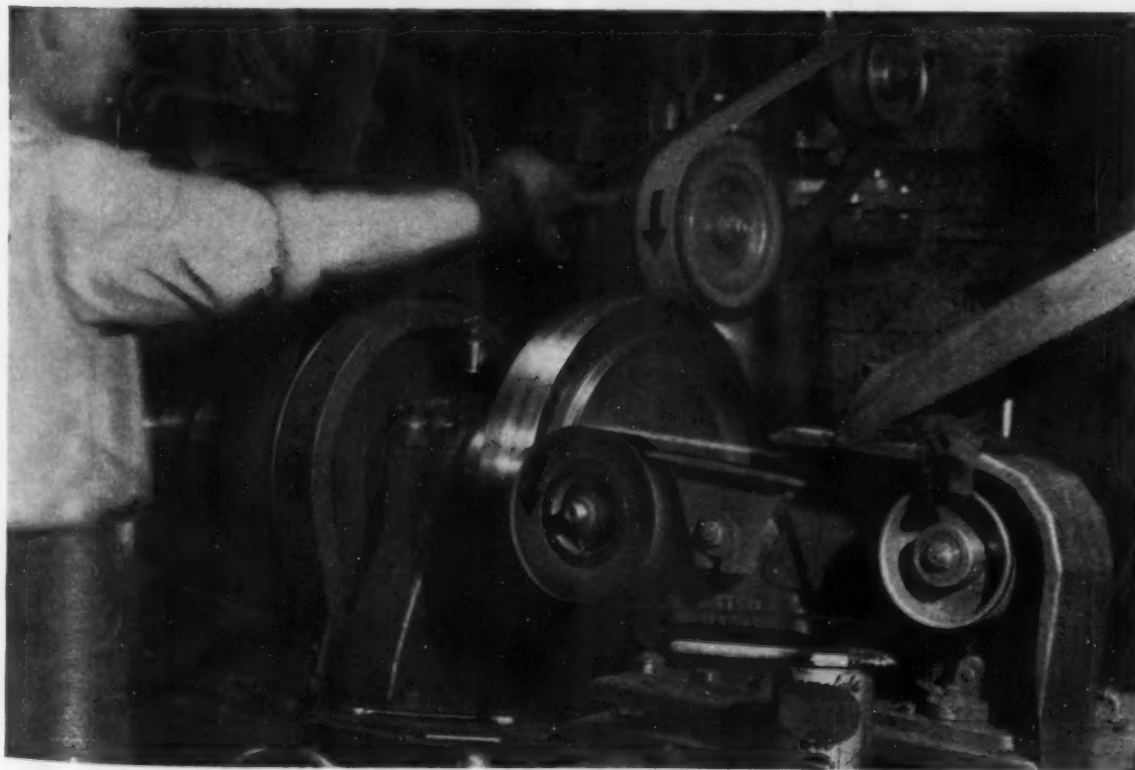
from the part being polished.

Modifications of the backstand idler arrangements described make many production combinations possible. By installing a contact wheel on one spindle of a bench grinder and bolting a backstand idler to the bench, a bench sander can be set up. Drills, chisels and tool bits can be sharpened. Small castings and machine parts can be strapped and polished.

Both sides of a flat metal part can be finished in one operation by using two backstand idlers. One idler is mounted on the floor and the other on the wall. Finished thickness of the work is established by the distance between the centers of the two contact wheels. Abrasive belts run in opposite directions to neutralize grinding drag.

Traveling frame grinders can be built with a backstand idler. An idler and heavy-duty drive motor, usually totally enclosed for dust protection are mounted on a hinge frame suspended from an overhead rail.

Special production set-ups may use one or more posts—mounted idlers set above contact wheels. Convenience of part handling is an important factor. Combination of an engine lathe with two belt grinders yields a fast, smooth finish on parts which cannot be polished in the usual way. A spring loaded wall idler provides tension and assures tracking of the belt that grind the OD of the work. A bench sander on the tool cradle grinds the face of the part.



COMBINATION of engine lathe and two belt grinders gives fast smooth finish on heavy parts.

Try it yourself—

TITANIUM

Can Be Deep Drawn



By J. W. Gulliksen
General Superintendent
Worcester Pressed Steel Co.
Worcester

♦ Commercially pure titanium sheet has been successfully deep drawn by Worcester Pressed Steel Co. using tools designed for deep drawing various steel cup-shaped parts.

♦ Chief problem has been scoring due to pickup of titanium particles. . . Bonderizing before application of a high-pressure lubricant proved helpful. . . An electrolytic treatment was also successful.

♦ Reductions as high as 38 pct have been obtained on 0.078-in. sheet in one draw. Drawing in several stages is possible if parts are stress relieved after each draw.

♦ THE GROWING IMPORTANCE OF TITANIUM in the field of metals caused Worcester Pressed Steel Co. to investigate the forming properties of the metal. A small lot of commercially pure titanium sheet was purchased and tried out in a set of existing tools with fairly good results. The metal appeared to have sufficient plasticity to make it suitable for deep drawing, although detail techniques of tool design, set up and production will require considerable further development.

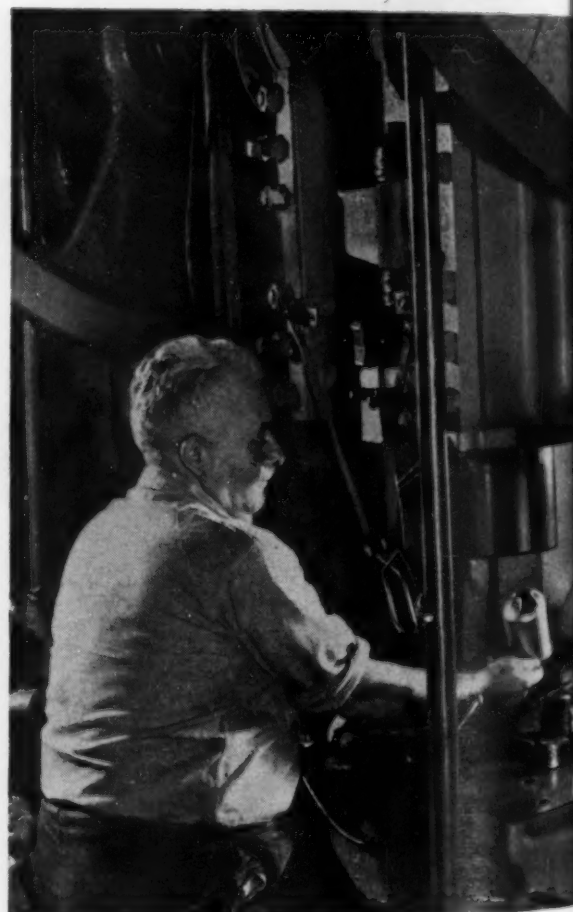
The art of deep drawing in presses is basically a matter of controlled plastic flow. The

THIS SURFACE TREATMENT WORKED

One of the best lubricants for deep drawing of titanium proved to be an electrolytically formed coating. First, all grease, scale and surface tension are removed. The cleaning method used depends on the type and condition of material.

Fixtures, holders, links and bus bar connections must make positive contact. The part is connected anodically at a bath temperature of about 60°F. Temperature will vary according to the size and shape of the piece. Current should range between 16 v and 30 v, with a time cycle from 30 min to 1½ hr, again depending on size or shape of piece.

Either sulfuric or oxalic acid can be used as an electrolyte. Solutions should be slowly agitated to give a uniform coating. Too rapid agitation creates a wash. After the work has been processed, rinse in clear cold running water and dry.



TITANIUM cups are deep drawn by Worcester Pressed Steel with dies formerly used for steel parts.

metal being drawn must be stressed beyond the elastic limit but not in excess of the ultimate tensile strength. A rather critical balance must be maintained between the various stresses involved. In general, materials having a fairly wide spread between the yield point and the ultimate tensile strength are best suited for deep drawing.

Commercially pure titanium sheet meets this condition moderately well in the annealed condition. Furthermore it has an elongation of 20 to 30 pct which should be a favorable factor.

There are several methods of expressing the severity of a drawing operation or measuring the drawability of a metal. The most common practice is to use the percentage of reduction from the diameter of the blank to the diameter of the cup. If a 6-in. diam cup were drawn from a 10-in. diam blank, the reduction would be 40 pct. This index was used throughout the tests.

Fig. 1 represents the initial effort. A cup 3 13/16 in. OD x 2 1/8 in. deep drawn from 0.062 in. Ti 75A. The percentage reduction from blank to cup was approximately 34 pct. The tools were made of hardened tool steel and had been used for making production quantities of similar cups from low carbon steel.

The first titanium cup produced showed severe score marks and scratches on the sidewall and the die was badly roughened due to galling or pick-up of small titanium particles. This type of trouble is quite serious and is due to frictional characteristics. As the metal flows over the surfaces of the tool, minute particles of titanium are rubbed off. These tend to adhere to the die by cold welding, forming rough spots which in turn dig further into the metal.

As the operation proceeds, the sidewall of the drawn cup becomes scored and the draw



Fig. 1. Initial effort in deep drawing of titanium cup. The cup is drawn from a blank of 0.062 in. Ti 75A. The reduction from blank to cup is approximately 34 pct.

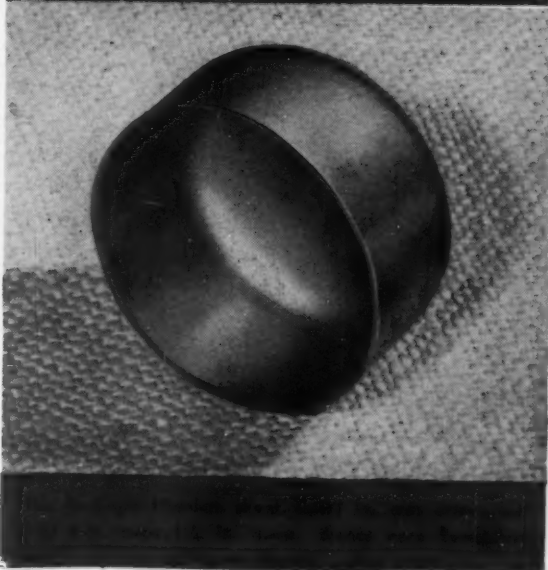


Fig. 2. Titanium cup after several draws. The cup is drawn from a blank of 0.062 in. Ti 75A. The reduction from blank to cup is approximately 34 pct.



Adequate film between sliding surfaces important . . . Many lubricants were tried . . .

die becomes rough due to pick-up. On subsequent cups the condition grows worse and even if the scored cups were acceptable, the buildup on the die soon reaches a point where the metal "seizes" instead of flowing and rupture of the cups result.

Therefore, an adequate film of lubricant between the sliding surfaces is highly important. Since the pressures required for drawing titanium are considerably greater than for mild steel, the problem of lubrication is increased. A variety of high pressure drawing lubricants on subsequent cups was tried. Bonderizing the metal before applying the lubricant proved helpful.

The Bonderizing solution consisted of Parker Bonderite—33 lb per gal of water with an addition of 7 g of sodium fluoride per gal at a temperature of 160°F. The time of immersion in the bath was approximately 10 min. Some samples were sent out to the Boston Nickel Plating Co., where they were given a special treatment. This electrolytic treatment, see box, has also worked well.

A set of tools used for drawing stainless steel cups was then tried. The cups, Fig. 2, were 2 3/4 in. OD x 1 1/2 in. deep and the material was 0.078 in. thick Ti 75A. Reduction was 38 pct. In this case, the die was made of a bronze alloy, Ampco metal. It was thought that a die of this material might eliminate the frictional problem. This did not prove to be the case and the results were approximately the same as with the tool steel die. Bonderizing proved to be essential in order to secure



FIG. 5—Titanium RC 70, 0.025-in. gage, was drawn into 1 3/8-in. OD cups 1 1/16 in. deep. Cups were stress relieved and redrawn twice. Final size: 1 3/16 in. OD x 1 5/16 in. deep.

DEEP DRAWING TITANIUM

1. Commercially pure titanium possesses sufficient ductility to take conventional deep drawing operations with maximum reductions of approximately 40 pct.
2. Where several draws are involved it is usually necessary to anneal between drawing operations. Stress relieving at 1325°F restores sufficient ductility for subsequent draws.
3. Stress relieving produces considerable scale which can be removed by the duPont process or the Hooker process.
4. Draw pressures are greater than for mild steel and appear to compare with pressures required for stainless steel.
5. Titanium seems to be sensitive to the rate of deep drawing. Tests were run at 1/2 to 3/4 the usual speed for mild steel.
6. Biggest problem to be overcome is the tendency to gall or score. Frequent polishing of dies is necessary to avoid a complete freeze-up. Best results have been obtained with Bonderizing, dry film lubricant, copper plating, and special treatments.

any acceptable cups. A chromium plated die was tried but showed no appreciable improvement.

Even though the problem of galling and scoring had not been solved, it was decided to explore what could be done by means of several successive press operations. For this purpose an oil filter case which is produced in large quantities from low carbon steel was chosen, Fig. 3. This case requires three drawing operations followed by a striking operation to set the flange at the open end and to form the stiffening ribs on the shoulder. The center hole is punched out and the flange press trimmed after the striking operation. The gage of the material is 0.078 in.

These parts were successfully made from Ti 75A using the same number of operations and with the same tools as used for the steel. However, the titanium work-hardened so rapidly that it was necessary to stress relieve after each draw to restore sufficient ductility for the subsequent forming. This stress relief was carried out by holding at 1325°F for 7 min and then air cooling.

In the course of these tests various expedients to remedy the frictional problem were attempted. Copper plating the blanks showed some promise. A dry film lubricant applied on a Bonderized surface also gave encouraging results.

The second and third draw dies were made of sintered carbide. As might be expected, the carbide dies showed less tendency to scratch and gall than the other die materials previously tried. However, the improvement was not as great as had been hoped for and the frictional problem was still present.

Attention was then given to drawing some of the lighter gage titanium. Rem-Cru RC 70, 0.037-in. gage, was drawn into cups, Fig. 4.

2 5/16 in. OD x 1 1/4 in. deep, a reduction of approximately 40 pct. Hardened tool steel dies were used. The material was Bonderized and a dry film lubricant used.

RC 70 material, 0.025-in. gage, was drawn into cups 1 3/8 in. OD x 11/16 in. deep, Fig. 5. These were stress relieved and redrawn to 1 1/32 in. OD x 1 in. deep. A second stress relief followed by a third draw produced cups 13/16 in. OD x 1 5/16 in. deep.

Similar draws were attempted with 0.016-in. gage RC 70 sheet. The first two draws were successful but the final stress relief did not entirely restore ductility and the metal cracked in the third draw. The success of the first two draws demonstrated that material as light as 0.016 in. could be readily drawn. Failure in the third draw would seem to indicate the need

for further refinement of the annealing practice to handle repeated treatment of such light material.

The experimental work on titanium has been almost entirely confined to the commercially pure metal. One attempt was made to draw Ti 150B but results were negative. The material fractured and appeared to be very brittle at room temperature.

The work which has been done at the Worcester Pressed Steel Co. has not been extensive enough to establish complete data. Much additional experience will be required to determine optimum conditions of draw radii, clearances, drawing speeds, lubrication, pressures and other details that enter into the art of deep drawing. However, it is felt that some valuable facts have been learned, see box.

NEW BOOKS

"Metal Data, Second Edition," by S. L. Hoyt. Presents engineering data—nearly 700 tables and graphs—on hundreds of metals and alloys. Covers both ferrous and nonferrous metals. Also lists commonly used test bars, corrosion data, conversion factors, applications of materials and properties of elements. Reinhold Publishing Corp., 330 W. 42nd St., New York 36. \$10. 526 p.

"Metallurgical Research in Uranium, Manganese and Nodular Cast Irons." Three papers, two of which are of special interest to the metalworking industry. One, "A Process for the Recovery of Manganese from Ores," is by T. A. Hendrickson. The other, "An Investigation of the Effect of Heat Treatment Upon the Hardness, Microstructure and Combined Carbon Content of Some Nodular Cast Irons," is by J. H. Barnett. Quarterly of The Colorado School of Mines, Vol. 47, No. 1., Golden, Col. \$1.50. 87 p.

"How to Handle Renegotiation," by William J. Casey and C. Richard Gunzer. Messrs. Casey and Gunzer present their analysis of renegotiation results (based on some 200 cases argued in Tax Court), to enable companies to make comparisons justifying their pre-tax profits in renegotiation. Their study shows how a company can develop a case to justify a higher than normal rate of profit by showing how it qualifies on statutory factors spelled out in the renegotiation law.

If a company can show it assumed extra risks, costs were reasonable, operations were efficient, that it made special contribution to the defense effort and that its business opera-

tion differed in character from that prevailing normally in its industry, it may be able to justify a case for a higher than normal margin of profit.

Arguments falling under these headings are summarized in a check list of the 46 factors which can justify a high rate of return on sales and on capital. How these arguments were developed in renegotiation cases appealed to the Tax Court is also shown. Business Reports, Inc., 225 West 34th St., New York 1. \$24.00. 204 p.

"Proceedings of the National Electronics Conference—1952." Vol. 8 contains technical papers presented at the 1952 conference covering a wide range of electronics development. National Electronics Conference, 852 E. 83rd St., Chicago 19. \$5.00. 835 p.

"Father of Air Conditioning," by Margaret Ingels, depicts the life story of Dr. Willis H. Carrier. Margaret Ingels, one of the first graduate woman engineers in the country, was for 33 years an associate of Dr. Carrier. Includes a comprehensive chronological table, 1500 to 1952, of events leading to modern air conditioning. Carrier Corp., 300 South Geddes St., Syracuse, N. Y. \$2.50. 170 p.

"Iron Millionaire: Life of Charlemagne Tower," by Hal Bridges. Story of one of the great early entrepreneurs. And also the inspiring story of how the Minnesota iron region was first explored and opened up. A tale of great risk by one man where others saw no opportunity. University of Pennsylvania Press, 3436 Walnut St., Philadelphia 4. \$4.75. 322 p.

Added attraction—

Permanent Magnetic Properties in

18-8



By Samuel Storchheim

Senior Metallurgical Engineer
Atomic Energy Div.
Sylvania Electric Products, Inc.,
Bayside, N. Y.

Cold reduction of annealed types 302 and 304 stainless steel wires causes the austenitic matrix to transform to martensite. The wires, initially non-magnetic, change partially to a ferromagnetic condition. Also these grades properly processed can be transformed almost wholly to permanent ferromagnetic alloys. Remanence increases and coercive force values decrease as the percentage of reduction is increased. A 2.0 pct increase of nickel in the composition retards these changes. Tensile strength and electrical resistance are also increased by cold reduction.

◆ Austenitic nickel-chrome stainless steels of the 302 and 304 types are paramagnetic in the fully annealed state. This condition of low magnetic permeability can usually be altered by cold working the alloy at room temperature. Depending upon the chemical composition, extent of cold deformation and sometimes the heat treatment of the metal, it can be converted partially or almost wholly to a martensitic permanent type ferromagnetic alloy.

The effect of varying percentages of cold reduction on three commercial 18-8 stainless steel wires, listed in Table I, was investigated by taking wire of 0.028-in. diam from each specimen, annealing it at 2150°F in a dissociated ammonia atmosphere and passing it through a series of progressively smaller diameter diamond dies in a conventional wire drawing unit. The wire was then drawn at 250 ft per min for several minutes to insure uniformity in the rate of reduction. The drawing machine was then stopped quickly. Wire re-

maining between each pair of dies was removed, labeled and tested. Analyses Nos. 1 and 2 were given a 92.0 pct reduction of area. Analysis No. 3, because of its comparatively higher nickel content and therefore its greater inhibition to transform to magnetic martensite, was given a 98.0 pct reduction of area. This was done to develop as much martensite in the wire as possible.

Tests included magnetic measurements of remanence and coercive force for all three analyses of wire. In addition, ultimate tensile strengths and resistivities were determined for wires of analyses Nos. 1 and 2.

The magnetic parameters, Br and Hc, were measured directly on hysteresis loops which were projected upon a previously calibrated cathode ray oscilloscope screen. The hysteresis loop tester used for these measurements was specially designed¹ and constructed, and ca-

¹ W. W. Wetzel, "Review of the Present Status of Magnetic Recording Theory, Part I," *Audioengineering*, Nov. 1947, 31, No. 10.

pable of accepting wires to a maximum of 1/8-in. diam. Wire required for testing had to be a minimum length of 3 in. The accuracy of this

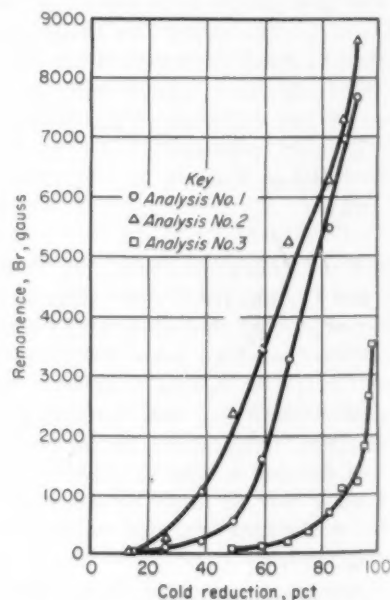


FIG. 1—Curves show remanence as a function of the percentage of cold reduction.

OBTAINED BY COLD WORKING

unit was ± 5 pct for the Br values and ± 2.5 pct for the Hc readings.

Tensile testing was carried out by means of a horizontal Scott Tensile Tester, and resistivities were obtained by use of the equation:

$$P = R \times CM$$

R = Resistance in ohms per foot of wire as obtained on a standard Leeds & Northrup Wheatstone Bridge

CM = Area of wire in circular mils

P = Resistivity in ohms-CM
ft

Several strands, usually six, of fine diameter wire, such as 0.004 in., had to be tested to obtain more accurate Br readings. The greater the area of wire involved, the more lines of flux were available for measurement, i.e., the hysteresis loop was longer and the Br was measured more readily. The Hc depended on the applied field. Once established, the Hc remained constant regardless of the number of wire strands used.

Relation to cold reduction

Data obtained for the per cent reduction of the different specimens are tabulated in Tables II to IV inclusive. Graphs in Figs. 1 to 4 inclusive more clearly reveal the relationships between remanence, coercive force, tensile strength, resistivity and per cent reduction of area, respectively.

In Fig. 1, the remanence increased in a similar parabolic manner for all three analyses as the per cent cold reduction was increased. The primary difference among the curves was their displacement from each other. Analysis No. 3 of the higher Ni content indicated a delayed initiation in the appearance of any appreciable ferromagnetic constituent, namely, about a 50 pct reduction of area as compared to about 15 pct for both Analyses Nos. 1 and 2.

Analysis No. 2 developed a remanence, at 92.0 pct reduction of area, 12.9 pct greater than that of analysis No. 1 and 597 pct greater than that of analysis No. 3. The lower remanence value for analysis No. 3 as compared to those of Nos. 1 and 2 was again attributed to the higher nickel content of analysis No. 3. The carbon contents did not appear to exert any readily discernible effect.

With increasing percentages of cold reduction of area, the plots of coercive force for

TABLE I

STEELS TESTED

Analysis No.	Chemical Composition, pct				
	Ni	Cr	Mn	Si	C
1	8.30	18.64	0.55	0.54	0.15
2	8.70	18.49	0.44	0.48	0.19
3	10.67	19.16	1.04	0.91	0.076

PROPERTIES OF STAINLESS WIRES Types 302 and 304 Stainless Steel

TABLE II

ANALYSIS No. 1

Reduction, pct	Hc, oersteds	Br, gauss	Ultimate Tensile Strength, 103 psi	Resistivity, ohm-cm per ft
0	no indication of magnetism		130	430
14	400	20	181	440
26	400	100	187	460
36	280	210	214	450
49	210	510	227	460
59	200	1650	264	420
66	170	3280	250	500
75	160	3920	263	500
82	120	5480	278	500
87	85	6950	344	580
92	80	7670	384	570

TABLE III

ANALYSIS No. 2

Reduction, pct	Hc, oersteds	Br, gauss	Ultimate Tensile Strength, 103 psi	Resistivity, ohm-cm per ft
0	no indication of magnetism		132	425
14	400	30	165	440
26	280	280	197	470
36	210	1070	219	458
49	140	2400	232	485
59	135	3480	278	440
66	120	6270	278	515
82	85	8260	292	535
87	75	7300	352	570
92	70	8850	403	585

TABLE IV

ANALYSIS No. 3

Reduction, pct	Hc, oersteds	Br, gauss
0	no indication of magnetism	
14	no indication of magnetism	
26	no indication of magnetism	
36	slight indication of magnetism	
49	440	70
59	400	140
66	400	180
75	340	380
82	340	700
87	340	1120
92	380	1240
95	380	1630
97	380	2640
99	300	3820

"Increasing percentages of cold reduction caused the austenitic matrix to be transformed . . ."

analyses Nos. 1 and 2 indicated a decreasing curvilinear relationship, Fig. 2. For analysis No. 3, the points plotted, especially for very high reductions of area, were erratic. However, the same general decreasing curvilinear trend was exhibited for this curve as for those of analyses Nos. 1 and 2. As with the remanence curve, the initiation of measurable coercive force for analysis No. 3 exhibited a delay in appearance as compared with those of analyses Nos. 1 and 2. Not only was the delay in obtaining measurable values of coercive force apparent, but the Hc values for analysis No. 3 were considerably greater for all percentages of reduction of area than those developed by analyses Nos. 1 and 2.

At 92.0 pct reduction of area, the Hc value for analysis No. 3 was 374 pct greater than analysis No. 1 and 440 pct greater than that of No. 3. The Hc of analysis No. 1 was 14.3 pct greater than that of analysis No. 2. It was again apparent that the higher nickel content of analysis No. 3 caused the marked difference in Hc values as compared to those of analyses Nos. 1 and 2. The effect of carbon was again indiscernible.

Resistivity increases with carbon

In addition, comparison of the Hc and Br values developed at particular percentages of cold reduction showed, generally, that as the Br increased, the Hc decreased, this with increasing percentages of cold reduction.

The relationship between the ultimate tensile strengths and increasing percentages of cold reduction for analyses Nos. 1 and 2 are shown in Fig. 3. Both curves, similar in appearance, indicated a continuous rise in tensile strength with increasing percentages of cold reduction. This is in agreement with previously published data.² The higher carbon content of

² Metals Handbook, 1948 edition, p. 554, American Society for Metals, Cleveland.

analysis No. 2 accounted for the upward displacement of its curve from that of analysis No. 1; i.e., for the same percentage of cold work the tensile value of analysis No. 2 was greater than that of analysis No. 1.

Although evidencing considerable scatter when plotted, the points in Fig. 4 representing resistivity v. percent cold reduction, still indicated a general increase of resistivity with increasing percentages of cold work. The curve for analysis No. 2 was displaced upward from the curve for analysis No. 1. This indicated that higher carbon contents tended to cause greater resistivities for wires receiving the same percentage of cold reduction.

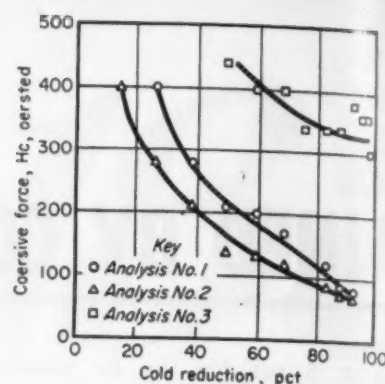


FIG. 2—Three analyses of stainless steel wires are plotted to show coercive force as a function of the percentage of cold reduction.

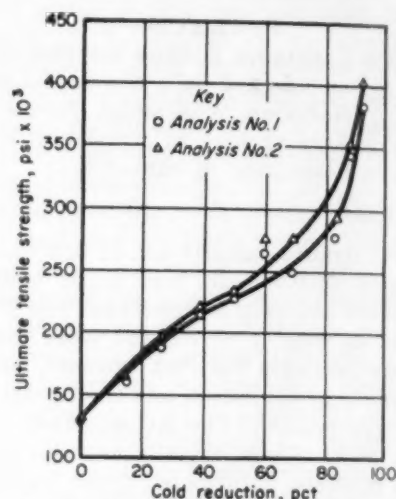


FIG. 3—Ultimate tensile strength increases with an increase in percentage of cold reduction.

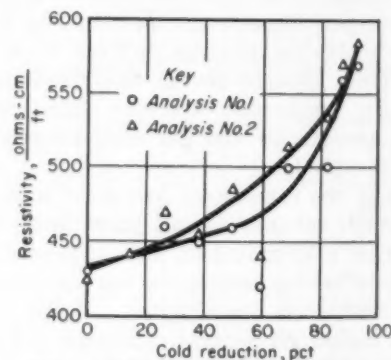


FIG. 4—Electrical resistance increases when the percentage of cold reduction is increased.

Increasing percentages of cold reduction caused the initial austenitic matrix to be progressively transformed to martensite. This change was evidenced by an increase in remanence, tensile strength and resistivity, and a decrease in coercive force.

Acknowledgment

The author thanks the Wilbur B. Driver Co. for its kind permission to publish this article.

Plastics:

MACHINERY MARKET BOOMS

Kettles, Mixers, Blenders Reactors and Roll Mills

Second of a Series

By H. R. Simonds
Consultant
New York

♦ Storage tanks and kettles are big uses of stainless . . . Because many metals contaminate plastics, nickel and nickel clad steels are widely used except where contamination is not a factor.

♦ Coming changeover from batch to continuous methods of plastic production will modify the types of machinery needed and to some extent the types of steel required.

♦ Today's metal requirements are 70 pct carbon steel, 10 pct cast iron, 15 pct stainless and 5 pct other metals.

♦ **MASSIVE AND EXPENSIVE EQUIPMENT** is employed in making prime materials for the plastics industry. Much of this equipment is made of stainless, nickel-clad and special steels. With plastic production soaring, metal consumption in the plastic machinery field is opening up new large markets. Closely related is the fact that the coming changeover from batch to continuous methods will shift the steel tonnage requirements to new types of machinery.

Ingredients used by the manufacturers of resins and other binders are chemicals or monomers which usually arrive in tank cars as liquids. On arrival these liquids are pumped into storage tanks and then, as needed, are fed into reactors or blenders. These storage tanks are usually made of stainless steel. Typical tanks are shown in Fig. 1.

Phenol is stored occasionally indoors but more frequently in insulated tanks outdoors. When a slight sacrifice in quality of the phenolic plastic is permissible, the phenol tank is made of flange quality steel plate. In the production of most plastics, reaction kettles form a major part of the equipment, and therefore represent a major steel item.

The typical resin kettle is a closed vessel with a built-in cover, a vertical agitator shaft, suitable discharge valve and a manhole. In addition, there are outlets for gages, sight glasses, vacuum pumps and reflux condensers. The kettle

is jacketed for steam, has a paddle or other mixing means attached to the vertical shaft and a drive motor.

A typical kettle is an elaborate and expensive piece of equipment. The term, kettle, in the plastics industry usually refers to the entire assembly — tank, condensers, receiver, vacuum pumps, motor, instruments, platform and supports. Such an assembly may cost \$50,000, weigh 85,000 lb and turn out 3 million lb of plastic molding powder a year. Most common kettle size, used for thermosetting plastics, is the 1500-gal capacity.

Metals used in such an assembly vary with the different resins, but approximately 70 pct carbon steel, 10 pct cast iron, 15 pct stainless steel and 5 pct other metals, principally aluminum and copper, are used. Chief determining

EFFECT OF METALS ON PHENOLICS Decreasing Order

Nickel
Aluminum
Copper
Chromium-nickel-iron alloys
Monel
Inconel
Mild steel

"Continuous operation in this branch of the industry is not far off . . ."

factor in selection is the effect of the metal on the physical properties of the resin being processed.

The International Nickel Co. in the table lists the metals used in order of their decreasing effect on the properties of phenolic plastics. While practice today favors the use of stainless steel for the parts of kettles and kettle assemblies in contact with resins, nickel-lined or nickel-clad kettles sometimes are used, especially when the catalyst is sulfuric acid. For the vinyls, Duranickel and Inconel equipment are popular because of the adverse effect of most other metals on vinyl resins.

Kettles are designed for batch processing and therefore must eventually give way to equipment designed for continuous operation. The place of the kettle in manufacture of resins has already slipped for two reasons: (1) thermosetting plastics made in kettles have been losing out production-wise to the thermoplastics; (2) manufacturers of thermosetting resins have

been turning to more efficient equipment. The subject of continuous processing of thermosetting resins is shrouded in considerable secrecy, but at least one company is using such a process and most authorities feel that continuous operation in this branch of the plastics industry is not far off.

Fig. 2 shows a row of kettles used in the production of phenol-formaldehyde resins. The drive in this case is by belt through bevel gears. Sight glasses are combined with the manholes and the shaft-stuffing box is set into the cover plate. A combination kettle-blender used in the production of Saran molding powder is built almost entirely of nickel in the shape of two cones with a supporting band of nickel-clad steel between.

Another major piece of equipment important in the production of molding powders is the mixer. This also is a batch production unit in contrast to continuous operation and therefore it also falls within the group destined for a diminishing demand. Mixers are used by every large manufacturer of vinyl plastics.

One such mixer, the Banbury, was developed for the rubber industry but was soon adopted by molding powder makers. It is essentially an enclosed rugged mixing chamber containing two powerful spiral rotors made of cast stain-

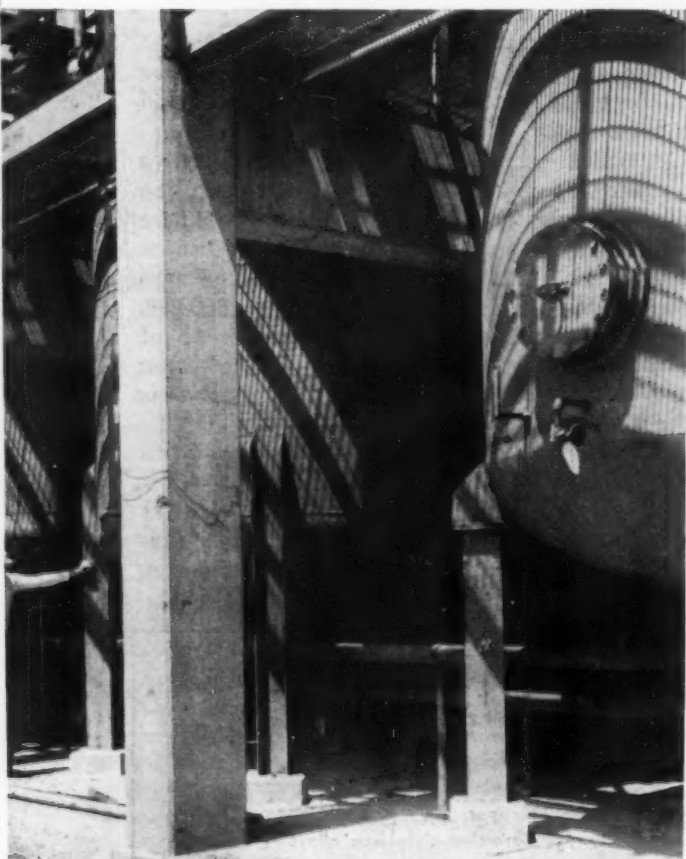


FIG. 1—Stainless steel storage tanks used to stock the phenol. Outside storage in insulated tanks is the usual practice. Courtesy U. S. Rubber Co.

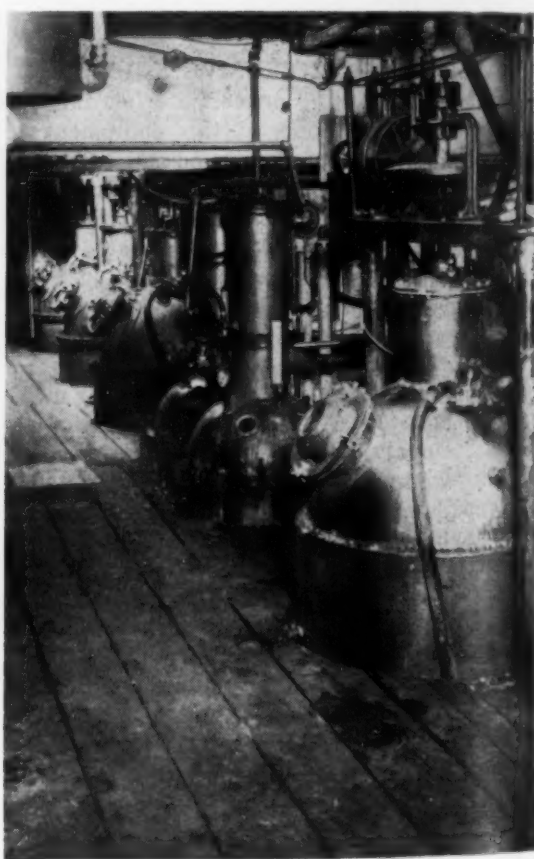


FIG. 2—Resin kettles are a big steel consumer item in the plastics industry. These kettles are used for making phenol-formaldehyde resins. Courtesy International Nickel Co.

less or carbon steel. The rotors are cored or bored for circulation of steam or cooling water as required. These rotors revolve in opposite directions and at slightly different speeds, thus keeping the stock in circulation. When carbon steel is used, the rotors are plated with a 0.003 to 0.005 in. coating of chromium. The guides are made of 304 annealed stainless.

There are other equally good mixers. One of these, Fig. 3, is designed for processing polyvinyl molding material. This is in effect a mixer and reactor and is used in combination with vacuum pumps and refluxing condensers in much the same way as described for kettles. The unit shown weighs 40,000 lb and costs \$45,000 and has an output on some vinyl materials of 2 million lb of molding compound a year. The tiltable bowl is machined after welding to give it a precision double bow-shaped bottom.

"Falling tower" uses stainless

Another widely used mixer is shown in Fig. 4. This is a type used in preparing urea molding powder. The type shown in Fig. 5 is used for preparing cellulose acetate.

Blenders, hammer mills, crushers and pebble mills are also used in the production of molding powder, depending on the process and the material. The object is to reduce particle size and to blend with fillers and other ingredients. In the case of Polystyrene, considerable secrecy and difference of opinion covers the operations between the original polymerization and the blending. Where no fillers are used and blending is done with lubricants and pigments, aluminum equipment is sometimes used. A so-called "falling tower" process is used by one company before the blending and here stainless steel is the contact metal.

Anneal before fabricating

The term "stainless steel" is regarded by most plastics equipment people as a definite entity. Purchasing departments simply order so much stainless-steel sheeting or plate without specifying what type of stainless steel they want. One manufacturer stated that it used 304 stainless because of greater ease in welding. Several manufacturers said they annealed all their stainless steel before fabricating.

Frequently there are two distinct operations in producing plastics. One is the original compounding of the material and the second is a warm-up or conditioning of the stock. Before sheeting or extruding stock for pelletizing or any other purpose, warm-up rolls are often used. One typical set of warming rolls handles 2000 lb in 8 hr, weighs 32,000 lb and costs \$14,000.

Probably the most generally used equipment in the production of molding powder is the roll mill. This consists of two rolls with axes parallel and in a horizontal plane, and both

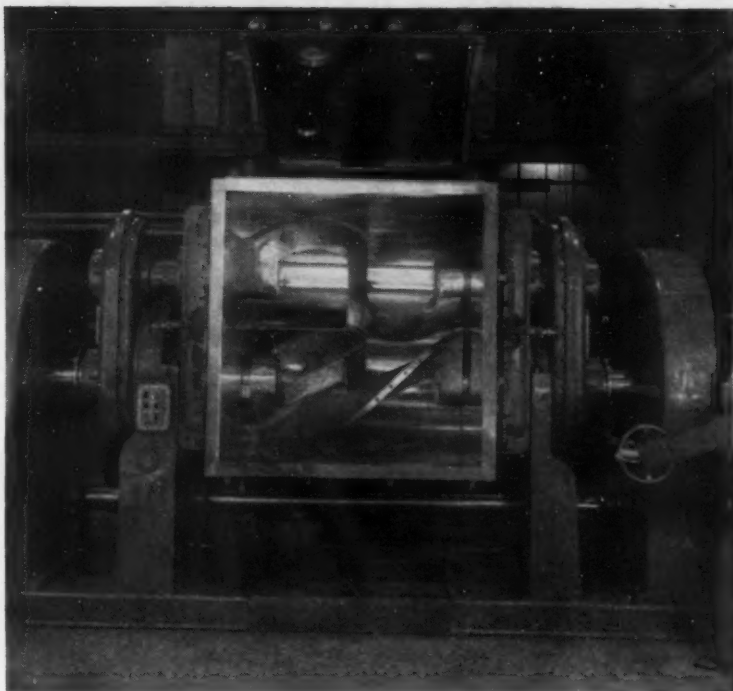


FIG. 3—This tiltable combination reactor and mixer weighs 40,000 lb, is made of stainless or chromium-plated carbon steel. Courtesy Reed Standard Corp.

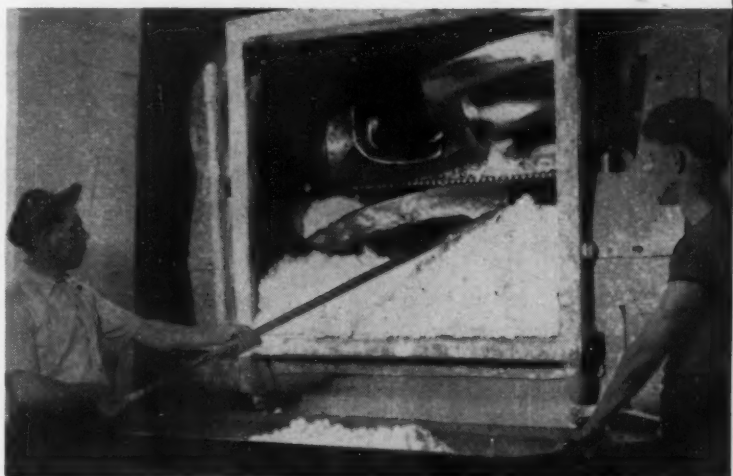


FIG. 4—Preparation of urea molding powder is done in this mixing mill. Courtesy American Cyanamid Co.



FIG. 5—Cellulose acetate molding powder is mixed with stainless blades and unloaded to conveyor.

adjustably mounted in a rugged frame. The rolls are often made of chilled iron by centrifugal casting methods.

After grinding to size the rolls may be chromium plated or may be used with no coating. In operation, the rolls are steam heated to about 225° F for most of the thermoplastic materials. The front roll is held at a slightly



FIG. 6—Typical roll mill has two 2-ft diam rolls. The rolls are hollow to permit heating or cooling. Courtesy duPont.

higher temperature to attract to it the batch being mixed. The rolls vary from about 3 to 6 ft long and from about 1 to 2½ ft in diam. They are set about ⅛ in. apart at the nip. A typical roll mill is shown in Fig. 6.

One method used in production of molding powder is to feed the blended resin and filler on to a set of rolls, to the front one of which the mixture will adhere as it softens. After heating and further mixing, the entire batch is scraped off by a scraper knife which is fed against the front roll. The dropped material is again fed to the roll mill and again scraped off. This procedure is repeated until conditioning has been completed.

Many other types of equipment are used in the production of molding powder. One important item is weighing equipment. Some units are designed for weighing liquids at the start and other units for weighing the dry powder at the finish. One molding powder manufacturer uses an elaborate automatic weighing and bag-filling unit which receives bulk powder at one side and delivers at the other side filled, sealed bags ready to be loaded into waiting freight cars.

Highly specialized chemical equipment such as the huge evaporators used in making Nylon is not included in this series. However, handling equipment where it applies particularly to plastics, Fig. 7, will be discussed later.

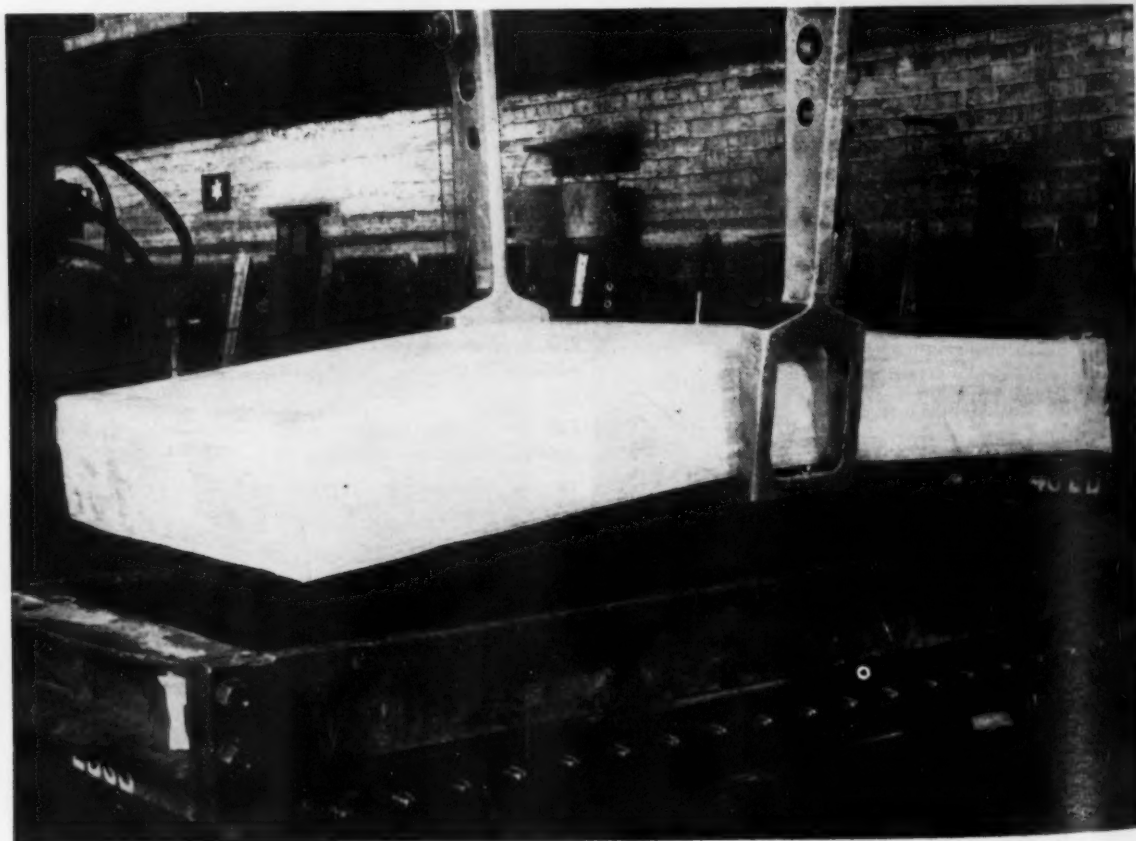


FIG. 7—Cellulose acetate cake which will be processed into powder is handled with stainless tongs. Courtesy Celanese Corp.

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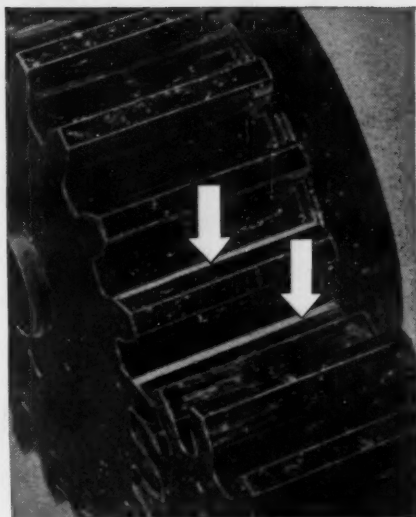
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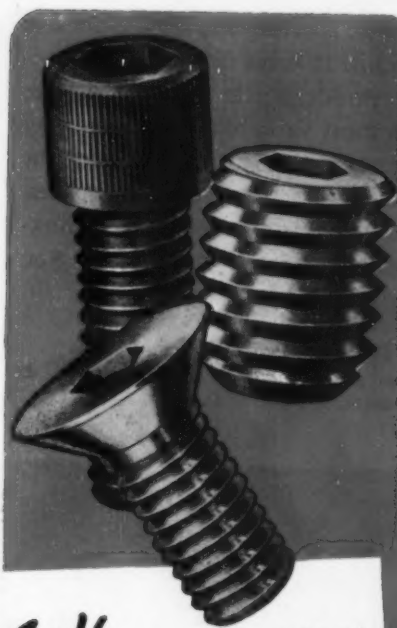


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Technical Briefs

Engineering



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SAFETY:

Thorough training can cut accidents involving chemicals.

Safety in handling corrosive chemicals is directly connected to the effectiveness of the employee's education, training and supervision, the Manufacturing Chemists' Assn., Washington, reports.

To facilitate the quick removal of chemicals from the body in case of accident, the following equipment — its location clearly marked — should be readily available in those areas where corrosive chemical hazards exist:

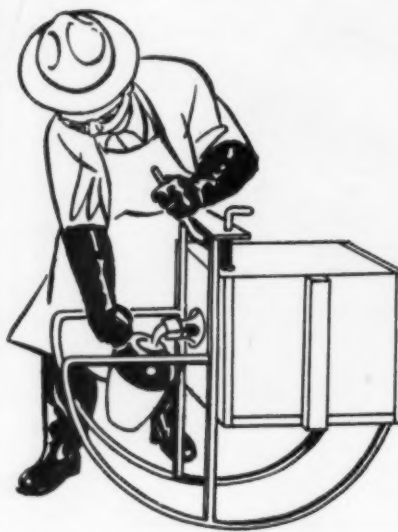
(1) Safety showers, treadle-type with quick-acting valves, capable of supplying large quantities of water under moderately high pressure.

(2) Bubbler drinking fountains, foot-operated, to facilitate washing the eyes.

(3) Stretcher and blanket if the work station is not near the dispensary.

(4) Respiratory equipment.

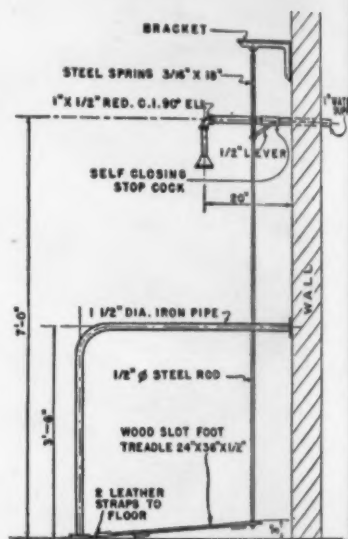
Rapid action safety showers of a treadle or lever type should be readily available in areas where corrosive chemicals are handled. These areas should have directional signs pointing the way to the nearest shower. As an added precaution, a green light is usu-



PROPER POURING equipment and protective clothing can cut down lost time resulting from improper handling of corrosive chemicals.

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 103. Just indicate the subject heading and the page on which it appears. Be sure to note exactly the information wanted.



SHOWERS are an important part of the safety program. They should be readily available where corrosive chemicals are handled.

ally placed over the shower.

Showers should be capable of supplying large quantities of clean water under moderately high pressure. They should be tested once every shift. Repairs, when necessary, should be made immediately. Blankets should be located near the safety showers for emergency use.

Employees should be trained to report all suspected leaks or equipment failure, and any signs of illness or burns.

Each employee should know what to do in an emergency and should be fully instructed in first-aid measures, and realize the need for prompt action in case of contact with corrosive chemicals.

More complete instruction sheets may be obtained from MCA in Washington, D. C.

POTTING:

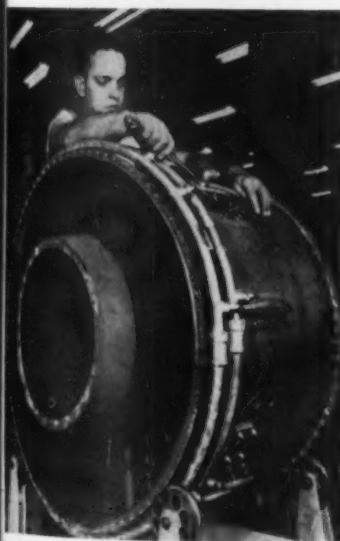
Resin retains good electrical properties from -60° to 200°C .

A new casting resin which will permit increased application of the technique of embedding and encapsulating (potting) electronic components and circuit assemblies has been developed by R. S. Aries & Associates, a New York firm of consulting chemical engineers.

Potting preserves delicate electronic parts from moisture or physical damage. Approximately 1 million lb of resins a year are already used for this purpose, even though the practice is only a few years old.

Sag In Heat—Projected use in 1956 is several times that amount. One of the difficulties so far has been that the resins used for potting have not been able to preserve their characteristics at elevated temperatures.

The new resin, called Aritemp, retains its excellent electrical properties from -60° to 200°C . It is further characterized by superior adhesion to metals and resistance to moisture vapor.

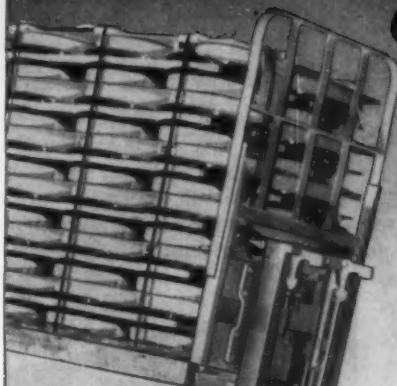


SENSITIVE THERMOCOUPLES, vital to automatic control of F-86D jet interceptor planes, are being installed in tail cone of a W-47-GE-17 jet engine. Made by General Electric, the thermocouples transmit temperature changes to an electronic control system which regulates fuel flow. The thermocouples stand heat between 1000° and 1900°F .

Turn Page

CLARK 1953 POWRWORKERS

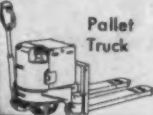
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—Technical Briefs—

SURGE GENERATOR:

Portable, low-cost unit makes lightning "stand still."

The synchronograph, a repetitive surge generator that makes simulated bolt of lightning "stand still" so its effects on electric power lines and equipment can be studied, has been developed for experimental use by engineers at the Westinghouse Electric Corp.

The new instrument was described at a recent meeting of the American Institute of Electrical Engineers by James M. Clayton, Westinghouse engineer.

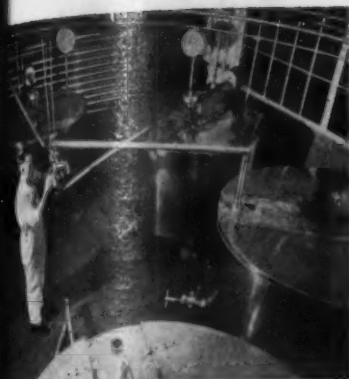
Portable—The synchronograph will enable engineers to make almost instantly calculations that might otherwise have taken weeks. It weighs about 75 lb, is portable and inexpensive.

The synchronograph consists of a repetitive surge generator that simulates a bolt of lightning surge; a remote receiver that picks up the original surge; and two oscillographs that record the surge at the point of transmission and at the point of reception.

Simulated—The repetitive surge generator supplies the simulated lightning wave 60 times a second to the power line or electrical equipment under test. The surge introduced into the system may amount to only 250 or 300 v, a relatively small voltage compared to a lightning stroke. However, the smaller voltage produces the same kind of wave on the oscillograph as the larger one, and, the effect of the larger voltage can be computed exactly.

Double Check — Power companies will be able to predetermine or double check the effectiveness of lightning arresters by making measurements on the actual equipment. In the past, such an operation required extensive mathematical calculations. Furthermore, electrical manufacturers will be able to measure the behavior of lightning surges in generators and transformers before they are even installed.

Turn to Page 152



The latest processing and production equipment for the food, chemical and petroleum industries is made of stainless steel. Practically unaffected by the corrosive action to which it is constantly subjected, this new equipment helps keep production costs down, greatly facilitates quality control.

Automotive applications for stainless steels become more numerous with each year's new-model cars and trucks. Today they include such diverse items as exhaust valves and door handles, water pump shafts and radiator grilles, decorative trim and truck bodies.

Lighter, more durable railroad cars are made possible by structural members and side paneling of strong, corrosion-resistant stainless steel. In both freight and passenger service, these cars are cutting railroad operating and maintenance costs, increasing the speed, safety and comfort of rail travel.



Why so many are saying...

MAKE IT STAINLESS

Manufacturers of everything from can openers and hub caps to railroad cars and jet engines are now saying, more and more frequently, "make it stainless."

Virtually indestructible by corrosive action, stainless steels defy the effects of air, water, foods, fumes and chemicals. They can be machined, formed and fabricated; their surfaces can be polished satin-smooth or mirror-bright. There are grades of stainless available to meet a wide range of mechanical and heat-resistant requirements.

Stainless steels are cutting production costs, improving product performance and appearance, increasing customer acceptance in an ever-growing number of applications. For complete information in regard to your own application, contact your supplier.

The finest stainless steels are made with Vancoram ferrochromium, ferrochrome-silicon and ferro titanium.



Architectural components of stainless steel range from screws, nails and decorative trim to roofing, curtain walls and theater marquees. Strong and corrosion resistant, they cut construction and maintenance costs, yet increase beauty and efficiency, in all types of modern buildings.

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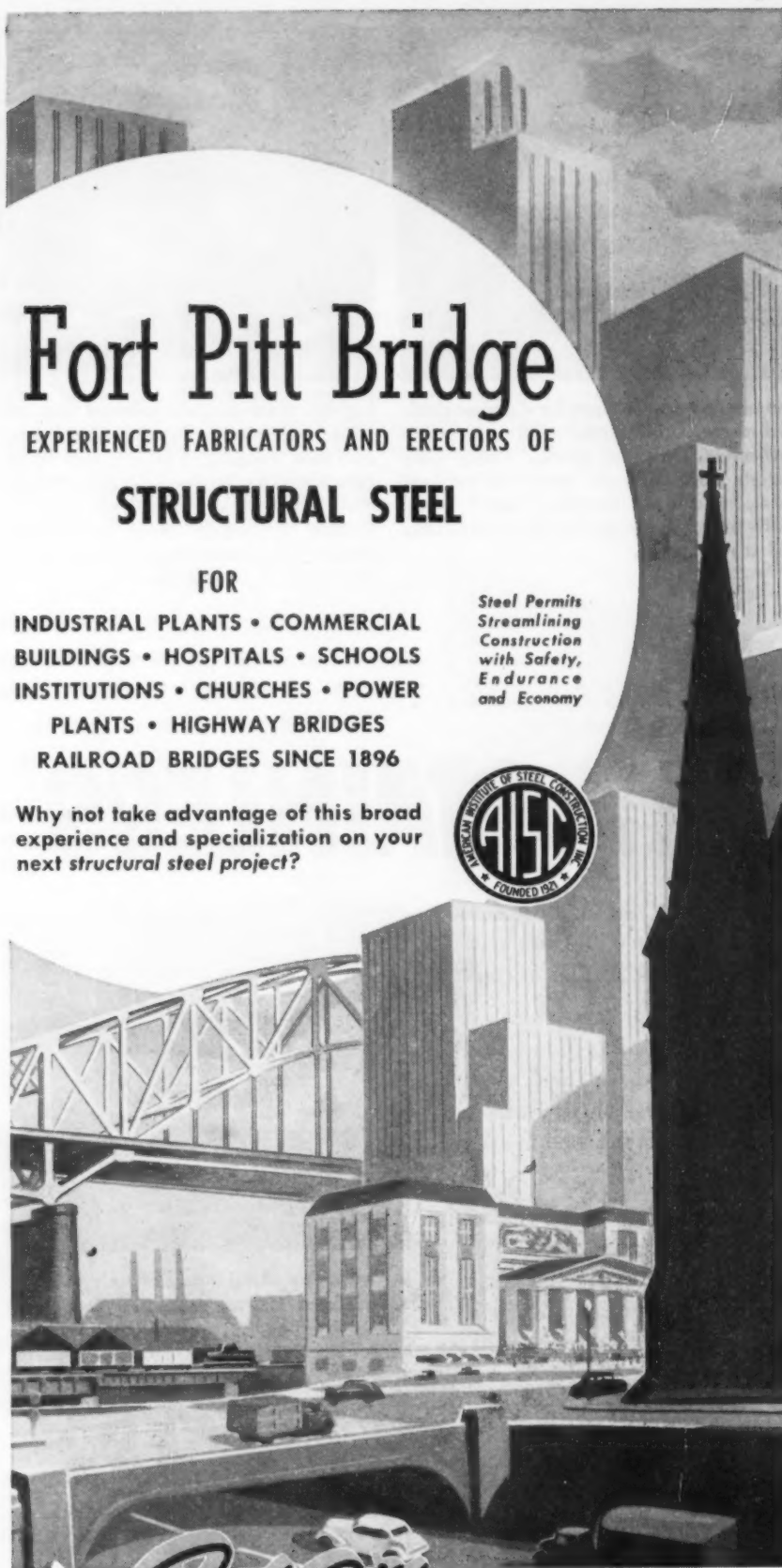
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Technical Briefs

CORROSION:

**NBS completes 13-year study of
how galvanized zinc protects.**

Studies of underground corrosion of hot-dipped galvanized steel pipe, recently completed by the National Bureau of Standards, results confirm previous NBS work in showing that galvanized steel having 3 ounces of zinc per square foot of exposed surface is highly resistant to corrosion in many soils which are very corrosive to bare steel.

Short lengths of both galvanized and uncoated steel pipe, and plates of zinc, were buried at test sites for periods up to 13 years. Located in widely separate parts of the United States, the test sites represented a wide range of soil properties.

Five-Year Period — After each of five periods of exposure, a set of specimens of each material was removed and returned to the NBS laboratories. After removal of the corrosion products, determinations were made of loss in weight, depth of the deepest pits, and the percentage of area of the galvanized specimens on which coating remained.

Although nominal weight of the zinc on all the coated specimens was 3 oz per sq ft, actual thickness varied over a wide range. This was shown by a large number of thickness measurements made by magnetic method, using unexposed samples of pipe from the same lot as the buried specimens. Electrolytic stripping method showed that a large part of the zinc that was applied to the steel pipe was converted into alloys of zinc and iron during the period.

Protection — Zinc coatings provided good protection in most of the soils. In one soil in which bare steel pipe was perforated by corrosion after exposure for only a few years, the coating on the galvanized specimens remained perfectly continuous throughout the entire 13-year period. In only two of the 15 soils, both organic, was

the zinc coating of negligible protective value.

An interesting finding of the NBS study was the high corrosion resistance that the galvanized specimens continued to show in most of the soils after the outer zinc coating, and even after the zinc-iron alloy layer, had entirely corroded away.

Coating — This continuing protection is tentatively attributed to an inorganic coating, probably silicious, believed to have been deposited by galvanic action between the outer zinc coating and the underlying steel or alloy layer. This tentative explanation is based in part on unpublished studies which indicate that the zinc-iron alloy layer does not protect steel sacrificially (cathodically), and that the alloy is no more resistant than steel to soil corrosion.

Analysis of the data obtained in the course of the two NBS field studies shows that the minimum weight of zinc coating required to protect steel for a minimum of 10 years depends on the nature of the soil environment.

Soil A Factor—A 2-oz coating gave sufficient protection in inorganic oxidizing soils, but for inorganic moderately reducing soils a 3-oz coating was required. Highly reducing soils, both organic and inorganic, require coatings heavier than 3 ounces per square foot.

In order to obtain maximum life from galvanized pipe in practice, it is necessary either to construct the entire piping system of galvanized pipe or else to electrically insulate the galvanized sections from pipe of other metals. Otherwise, the zinc coating will be removed by galvanic action.

Rubber-Forming Press Shown

Trial run of a new 2000-ton hydraulic rubber-forming press made by Clearing Machine Corp., Chicago, was recently demonstrated for the Kawneer Co., Niles, Mich., which will soon put the unit in operation at its plant.

Turn Page

It's the Finish that Counts

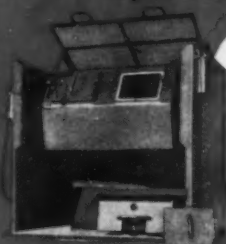


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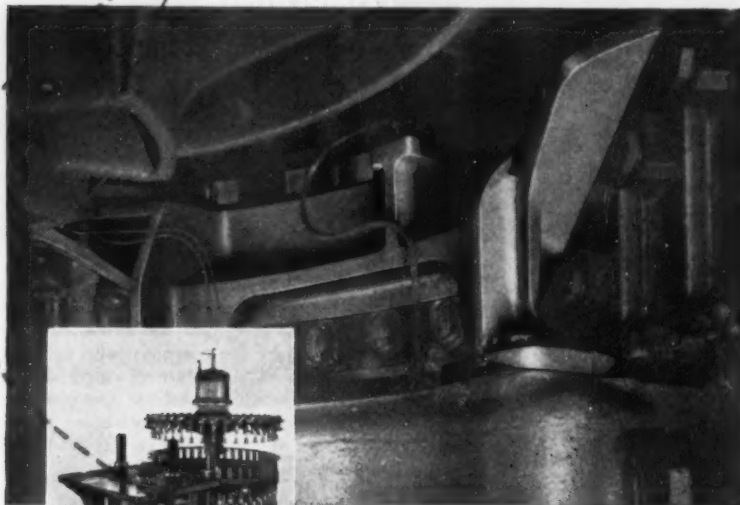
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CALLING A FIGURE IN A bottle dance



LEBANON Castings ARE AT WORK

EVERYONE is fascinated by the sound and action of modern bottling machinery at work. It's the cams that "call the figures in this bottle dance"! And these cams have to be tough.

In Crown Cork & Seal Company's CEM 40 bottling machine, illustrated above, the sturdy cam is a Lebanon CIRCLE  special alloy steel casting. The efficiency of this machine that fills and caps many millions of soft drink bottles a year, is due in part, to the special wear and endurance properties built into the Lebanon Alloy Steel employed in casting the cam. The cam illustrated must hold its form and size, must keep wear to a minimum thereby eliminating expensive machine down-time.

Wherever castings are required, it's sound practice to use only the highest quality. Those bearing the CIRCLE  trade mark are high quality products of true Lebanon craftsmanship.

You should see . . . STEEL WITH A THOUSAND QUALITIES

This 37 min., 16 mm. full color sound film showing the making of steel castings from blueprint to end use should be shown to your staff. For information write: Dept. A, Lebanon Steel Foundry, Lebanon, Pa.

LEBANON Castings

CARBON, SPECIAL ALLOY
AND STAINLESS STEEL

LEBANON STEEL FOUNDRY

LEBANON, PA.

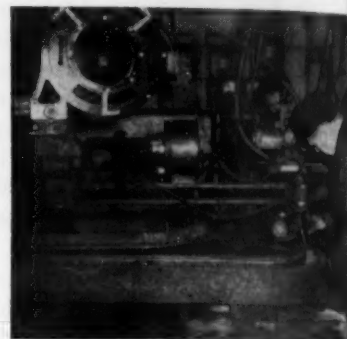
—Technical Briefs—

WELDING:

Auto trailer goosenecks easily welded with unusual setup.

When the Olsen Mfg. Co., of Boise, Idaho, took on the job of fabricating 150 automotive trailers, the welding of two "goosenecks" on each trailer looked like a difficult fabrication problem.

Due to the size of the machine carriage in the shop, the weld could not be completed in one setup, and special positioners would make the job unprofitable.



RADIAL ARM support eliminates the need for costly positioning devices and allows for Unionmelt welding of goosenecks from one setup.

Problem Solved — The problem was solved by using a unionmelt welding head mounted on a radial arm support, and a simple track was made for the drive wheel of a Linde Air Products Co. Oxweld CM-16 machine carriage.

With this apparatus and guiding arrangement, the required welds are made quickly and easily. More than six miles of high-quality welds have been made on similar "goosenecks" since this equipment was installed.

MATERIALS HANDLING:

Six suggestions for improved conveyer performance offered.

Six suggestions for performing necessary operations on package loads at the same time as they are being moved by conveyers were presented by H. C. Keller, manager of engineering, Lamson Corp., at a recent New York meeting of the American Society of Mechanical Engineers. Suggestions include

several labor saving ideas:

(1) Weigh loads while moving on conveyers; (2) Count loads automatically, if possible; (3) Automatically deflect loads so that they can be distributed to various buildings, floors and floor areas.

(4) Use up-enders, down-enders and automatic vertical conveyers to place the units being conveyed directly into machines instead of simply bringing the units to the vicinity of the machine.

(5) Use conveyers as live storage—keep work moving to eliminate unnecessary loading and unloading between operations.

(6) Use conveyers to automatically segregate and accumulate units into pallet loads, shipping slugs or groups for sealers to eliminate frequent setting and adjustment of sealers.

Also suggested was better paper work in handling jobs so that orders, work sheets and the like are at the right place and at the right time for continuous flow of materials through a plant.

COPPER:

NBS studies tensile properties as related to previous strain.

Strength, ductility and hardness of copper are strongly affected by its prior strain history, studies recently completed by the National Bureau of Standards indicate.

Tensile tests were made on oxygen-free high-conductivity (OFHC) copper initially as annealed, as cold-drawn different amounts, and as pre-strained in creep at 110°, 250°, and 300°F.

How Strained—Considerable interest has been stimulated among metallurgists by suggestions that the tensile properties of metals are dependent only upon the instantaneous strain state of the metal, and are practically independent of the manner in which this state is attained. Previous NBS work has shown that as some metals and alloys are deformed, hardening and recovery occur in such a manner that sub-

Turn Page



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answers many questions that mean better production, more profit for you. Just look at the table of contents:

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sequent tensile properties are materially affected.

Four bars of OFHC copper, 99.99 plus pct pure were used. All had been processed from the same lot of copper, but each had been subjected to different conditions of annealing or cold drawing.

Tested—Specimens taken from the various bars were subjected at the Bureau to different amounts

of prestraining in creep under tension at 110°, 250°, or 300°F. The differently-preconditioned specimens were then all tested in tension at room temperature at the same rate of extension of 1 pct per min.

Cold-drawing the copper at a relatively fast strain rate generally resulted in increased strength and hardness, but in decreased ductility (as measured by

the extension and reduction of area at fracture). Prestraining at a high temperature or at a low strain rate, on the other hand, generally resulted in reduced strength and hardness as well as reduced ductility.

Lower Yield — Specimens with the larger grain sizes showed lower yield strength and hardness values. Grain size had very little effect on tensile strength, fracture strength, and ductility. Hardness values of the fractured tensile specimens, obtained at room temperature, confirmed the results of the tensile tests.

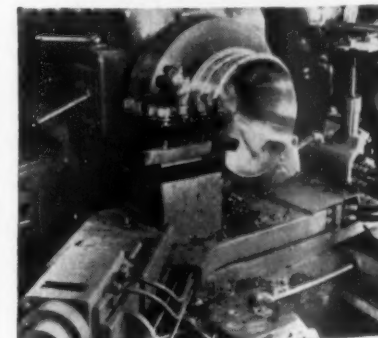
The microstructures of the tensile specimens were, in general, consistent with previous assumptions that cracks of a transcrystalline nature, and substructures, are nucleated during the second stage of creep, and that these phenomena are associated with prestraining at low temperatures and fast strain rates.

Fractures—Cracks thus nucleated grew to microscopic dimensions during the tensile tests. Prestraining at elevated temperatures and slow strain rates tended to result in fractures of a less ductile type and in cracks of an intercrystalline nature.

MACHINING:

Smoother, better finish possible on follower-equipped lathe.

Machining of difficult contours for guided missile parts at Rheem Mfg. Co., Downey, Calif., is simplified by equipping standard lathes



STARTING CUTS taken with roughing tool on outside diameter match dimensions of inside diameter. Stylus, template, tracer valve guide cutting tool.

INSURE IMPROVED DESCALING & DERUSTING

Without the Hazard of "Strong" Acids!

Muriatic and sulphuric acids are the time-honored materials for pickling . . . but they are relatively undependable wherever the consequences of attack on the metal are serious. They are hard to handle . . . hard to store safely. Above all, they are always corrosive fluids, ready to attack humans the instant there is contact with any part of the body.

Use a Solid that is Inert until Dissolved

In plants all over the country, wherever descaling and derusting have to be done, Magnus D-Scale-RS is replacing mineral acids. It is shipped as a crystalline solid, chemically inert until dissolved in water. Then it becomes a highly effective pickling acid.

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Magnus D-Scale-RS is a fast-acting acid on scale and rust. But it is inhibited against attack on the metal proper. It insures far better pickling action than mineral acids. It is fumeless in use . . . safe in handling and in storage. It can be used either in hot or cold solution . . . in tumbling barrels as well as in tanks.

WRITE FOR BULLETIN #36

The facts it contains will open your eyes to the advantages of pickling in the modern D-Scale-RS way!

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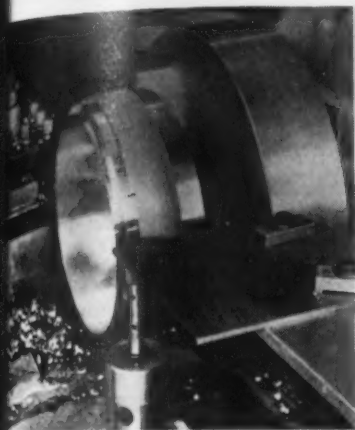
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AGE



GUIDED MISSILE part is rough and finish machined in 68 min using duplicator compared with 3 hr previously needed. Here outside diameter is finish machined.

with followers, requiring only 68 min to complete the part, as compared to conventional method of 3 hours.

In turning the inside and outside diameters of these air tank heads, 23 lb of stock at 12 in. diam must be removed from rough forgings of 4130 aircraft steel. This is accomplished with ± 0.005 , -0.000 tolerances.

Radius—A full spherical radius had to be cut inside. The contour starts straight blends into $2\frac{3}{4}$ in. radius and blends again into 8 in. spherical radius. By ordinary methods this seemed almost impossible, but the problem was easily solved with installation of Turchan hydraulic duplicators.

A stylus point follows the template to guide the tool by power cross feed, reproducing the exact contour on the part. Set-up is easy and tooling simple.

Advantages—Advantages include use of conventional tools which produce a better, smoother surface finish than can be obtained with form tools. The finish tool for making the final cut requires no adjustment for size from rough to finish as tools are set in proper relation.

Facing to length, inside bore and radius to centerline are all controlled by the template and first size setting when set-up is made. Calipering is confined to first size setting.

Turn Page

February 12, 1953

SHENANGO Centrifugal
CASTINGS

... KEY TO SAVINGS

These ram pistons, centrifugally cast of Meehanite Metal for 300-ton hydraulic press, must withstand 4,000 p.s.i. Completely machined and assembled by Shenango.



Teamed up for longer life under pressure

SHENANGO CENTRIFUGAL CASTINGS OF MEEHANITE METAL

FOR pressure service . . . for almost any severe service . . . it's hard to match Shenango centrifugally cast Meehanite Metal.

First, Shenango's centrifugal process means a uniform, high-strength, pressure-dense casting, free from sand inclusions, blow holes and other defects. Next, in Meehanite Metal you have finer graphite flakes, always more evenly dispersed, thus avoiding stress concentrations and permitting a finer finish.

So here's a combination you just can't beat for wear-life . . . for resistance to abrasion, pressure or shock . . . for long-range economy!

If your plans call for essentially symmetrical parts, large or small, rough, semi- or finish-machined, check with Shenango. Get all the facts! Informative bulletins are yours for the asking.

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Technical Briefs

ENAMELED PIPE:

Unusual troughs and drying units
speed output of pipe.

Successful application of porcelain enamel coatings to long lengths of black steel pipe, has been accomplished by Barrows Porcelain Enamel Co., Cincinnati, by designing and building an unusual dipping machine and separate drying unit.

The two units prepare the pipe for fusion of the coating. This continuous fusion of the ceramic coating to the pipe is accomplished by a special furnace. The two new pieces of equipment solve several problems in the handling of the pipe prior to fusion.

First Operation—In the application of ceramic coatings to pipe, the first operation is a thorough sandblasting inside and out. Next the slip or wet enamel must be applied to the metal base. This slip is a water vehicle solution and can be either dipped or sprayed.

For uniform application and close control of thickness, Barrows elected to apply the slip in a dipping operation. This meant that pipe as long as 21 ft had to be coated completely both inside and out. The excess slip had to be drained away from uniform application on all exterior and interior surfaces of the pipe.

Holds the Slip — The dipping unit consists of two long troughs



PRODUCTION of vitreous enameled pipe moves faster with the automatic drying unit at Barrows Porcelain Enamel Co., Cincinnati. Steam-heated air warms pipe, prevents unwanted condensation within pipe.

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BIGGER CUTS on steel tubing are possible with this new abrasive belt grinding machine developed by Production Machine Co. and Behr-Manning Corp. Abrasive belt is also used on steel feed wheel. A 25-hp motor drives the grinding belt past the work at up to 10,000 sfpm.
Turn Page

AGE
February 12, 1953



Two profitable ways you can use Cleveland's Production Service for your Specially Designed Parts

Your non-standard parts can be manufactured complete (above) ... or pre-formed by forging, ready for further shaping and machining in your plant (below). Made by the Kaufman Double Extrusion Process, your design is produced with accuracy in dimensional detail—is stronger through forging by our process.

Find out how Cleveland can help you in your special parts production. Write for bulletin "Specials by Specialists".



CLEVELAND *Top Quality* FASTENERS

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STROM *is your* BEST BALL BUY

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—Technical Briefs—

BETTER SOLDER JOINTS:

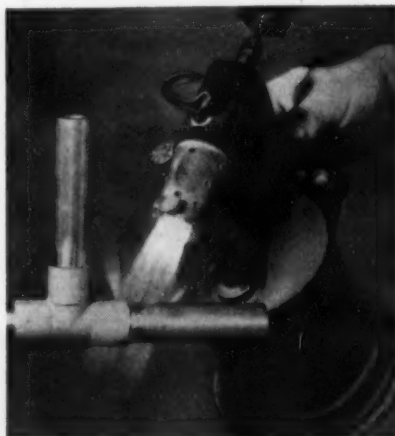
Copper water pipe, fittings are easily joined.

Copper water tube and fittings designed to provide proper tolerances may be easily joined using soft solders by following five simple rules. Pretinning is unnecessary because capillary action will draw molten solder between the tube end and the inner surfaces of the fitting to form perfect, water-tight joints. Here are the five simple rules:

1. Polish outer tube ends and inner surfaces of fittings.
2. Apply a suitable flux to these areas.
3. Apply heat and solder.
4. Remove residual solder and flux.
5. Let joint cool.

Cut Ends Square — Tube ends should be cut square with a hacksaw having 24 or 32 teeth or by means of blade cutters which are available for diameters up to three inches. A template of thin straight-edged metal or stiff paper is helpful as a line guide for saw-cuts in large diameter tube.

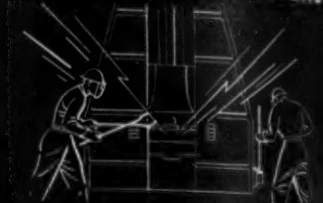
Mitre tools are available for cutting copper water tube sizes up to two inches. Burs are easily removed from inside and outside tube edges with a half round file. The chamfering of these edges



AT RIGHT TEMPERATURE solder flows into joint until it is filled. Avoid overheating and burning of flux. Clean pipe ends and inside of fitting with steel wool.

Turn to Page 162

M-S-A EAR DEFENDERS



keep harmful noises out!

If your workers "can't hear themselves think," chances are you'll hear about it in lowered production and damaged hearing.

Loud industrial noises sap energy, interfere with job concentration, and sometimes result in serious hearing loss. M.S.A. Ear Defenders block out these costly noises, yet allow wearer to hear warning signals, speech, and telephone conversation.

M.S.A. Ear Defender design insures

comfortable fit; complete closure of ear canal; easy to insert, remove. Ear Defenders are easily cleaned with soap and water. Convenient carrying case keeps them clean in pocket. Write for details.



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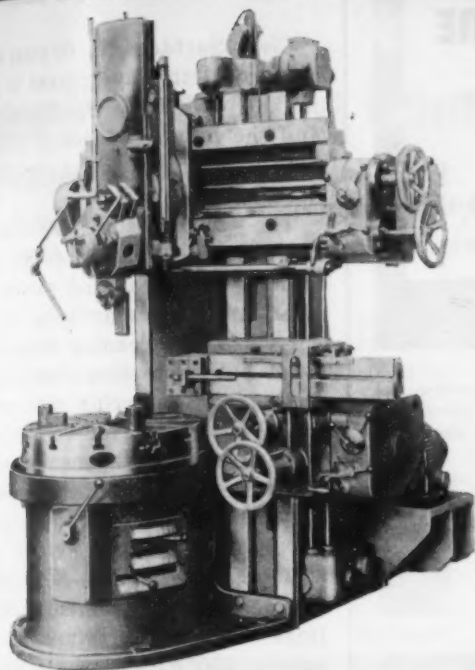
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Arranged for direct V-Belt motor drive, hardened and ground gears, 5-Face Turret and Side Head, power rapid traverse to both heads.

SIZE.....36"

Maximum swing with side head	33 1/2"
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Diameter of face plate	33"
Table speeds, R.P.M.	15 to 190
Maximum turning height above face plate	31 1/2"
Drive motor	25 HP
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We feel that by continuing to do what we say we'll keep all our old friends and make a lot of new ones. THE EARLE GEAR & MACHINE COMPANY, 4707 Stenton Ave., Philadelphia 44, Pa.

EARLE GEARS

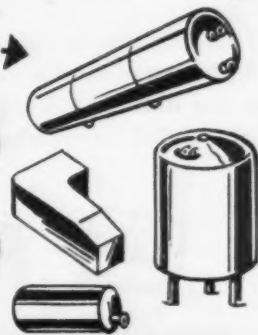
It's good business to do business with EARLE!



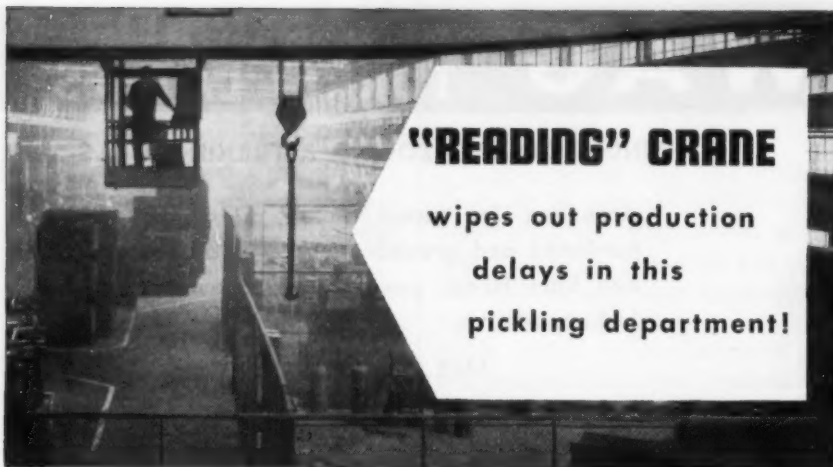
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PLATE STEEL,
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can make it!

OTHER SAMPLES OF STOVER FABRICATION

Think of Stover in connection with your steel fabrication requirements. Stover engineers can help you with the specifications if you like, and the sheet and plate steel experts in the Stover organization will produce your fabricated article to customary Stover high quality.



STOVER STEEL TANK & MFG. CO.
FREEPORT, ILLINOIS



"READING" CRANE

wipes out production
delays in this
pickling department!

A prominent producer of automobile frames found production slipping. Figuring it was due to inefficient load handling equipment in his pickling room, he called in a "Reading" handling engineer.

After installing a 10-ton "Reading" overhead traveling crane he found his problem solved. Now the operator simply pushes a button. The motorized crane, traveling 400 feet per minute, does all the work.

Employee morale is higher because fatigue is eliminated. And the extra efficiency obtained resulted in improved production.

Further information on "Reading" Electric Cranes will enable you to judge their advantages for your own load handling operations. Get our latest 16-page bulletin, "The Why and How of Faster Production. Write to:



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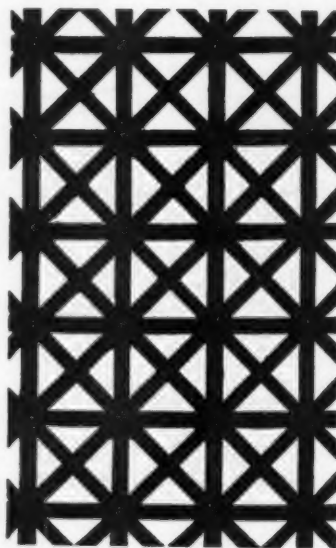
READING CRANES

Hendrick Ornametal

TRADE MARK

This is a lightweight type of grille especially suited for radiator enclosures, stove panels, kitchen cabinets, clothes and broom closets, lockers, and similar applications. It is made of a special bright finish, cold rolled steel, suitable for painting or plating, and is available in a wide range of stock size sheets and gauges.

Hendrick Ornametal can be furnished in a variety of attractive designs, the one illustrated being "Smalcane." Write for full information.



Perforated Metals
Perforated Metal Screens
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Manufacturing Company

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

—Technical Briefs—

will make joining of tube and fitting easier in the larger sizes.

Clean Surfaces. No. 00 steel wool or sand cloth may be used to polish the outer surfaces of tube ends and the inner surfaces of fittings before flux is spread on these areas.

The flux assures chemically clean surfaces and prevents oxidation when heat and solder are applied. Flux should be mildly corrosive for cleaning metal surfaces but this action should cease during the soldering process. A flux best suited for copper consists of zinc and ammonium chlorides prepared with petrolatum in convenient paste form.

Low Temperature—Soft solder is adequate for joints in water lines where temperatures do not exceed 250°F. and there are no excessive pressures or stresses. Types of solders that may be used include 50/50 tin-lead, 95/5 tin-antimony or other tin-lead alloys.

Heat may be applied to the joint by means of a gasoline blow torch or an air-gas torch of suitable size. If a torch is used, wire solder should be applied as the flame is moved away from the joint.

Melts and Flows—At the right temperature solder will melt and can be flowed into the joint until it is filled. Care should be taken to avoid overheating the joint and consequent burning of the flux. Solder will not enter the joint and its surfaces will have to be re-cleaned should this occur.

The soldering of fittings that are more than 2 in. in diam may be done by heating with one or more torches but greater care is required to prevent spot overheating, particularly if more than one heat source is applied.

Large Fittings—If the flame is moved uniformly over the entire area of the fitting until a point just below the melting point of the solder is reached, large fittings can be conveniently soldered by reapplication of heat to limited areas.

New Wage-Price Round Soon to Confront Industry

Contract reopenable on wages May 1 . . . Union free to strike June 30 . . . Price controls must end by Apr. 30 at latest . . . Some increase sure . . . But no general hike expected soon.

The biggest question now facing the steel industry is what to do about the seventh wage-price round.

It will have to find a satisfactory answer by the end of the second quarter if it hopes to keep production going in high gear.

Now that wage controls have been kayoed by White House order, free collective bargaining will be restored in the industry.

Meanwhile, steel price controls are certain to be out the window by Apr. 30.

Thus, the way is being cleared for a wage-price relationship based on free market factors, as opposed to previous balance-of-power settlements from Washington.

Free to Strike . . . The possibility of increased labor costs is important to the price picture. The United Steelworkers of America are free to ask for a reopening of their contract (on wages only) anytime after May 1. If no agreement is reached by June 30, the union may strike.

Lifting of price controls will challenge statesmanship of steel leaders, who have no thought of juggling the ball.

Some Rises Sure . . . Some price increases are inevitable. But they will not come overnight—except for a few small, marginal producers whose costs are high. Industry-wide advances, when they come, will be selective. Adjustments will be based on cost of production plus a reasonable margin of profit.

Some steel companies may use the opportunity to restore a balanced price relationship between products. This balance has be-

come somewhat distorted due to limited, across-the-board increases permitted under controls.

If the price decisions were based solely on what the market will bear, producers could hike prices almost at will with lifting of controls. Steel-hungry consumers are paying conversion prices double and triple regular mill prices for hard-to-get items. And marginal producers have substantial order backlogs despite prices well above the bulk of the market.

Reasons for Caution . . . But there are at least three good reasons why there will be no rush toward a general price increase: (1) Steel leaders will not risk adverse public reaction to precipitate advances. (2) They will lean over backward to avoid embarrassing the first "friendly" Administration in 20 years. (3) They have one eye cocked to see what a new wage contract might cost.

Knowing they will be on the spot, industry leaders will authorize no price increases without economic facts to back them up. They have been loud in their contention that the average increase of \$5.29 per ton allowed after last summer's strike was not enough to cover increased costs. Costs have continued to rise since then.

Expect No Strike . . . While the strike was largely responsible for a decline in steel earnings last year, the industry points to 1951 (when there was no strike) as proof that high taxes and costs have hurt profits. Compared with 1950, industry earnings in 1951 were off 13 pct. THE IRON AGE estimates steel earnings declined another 20 pct in 1952.

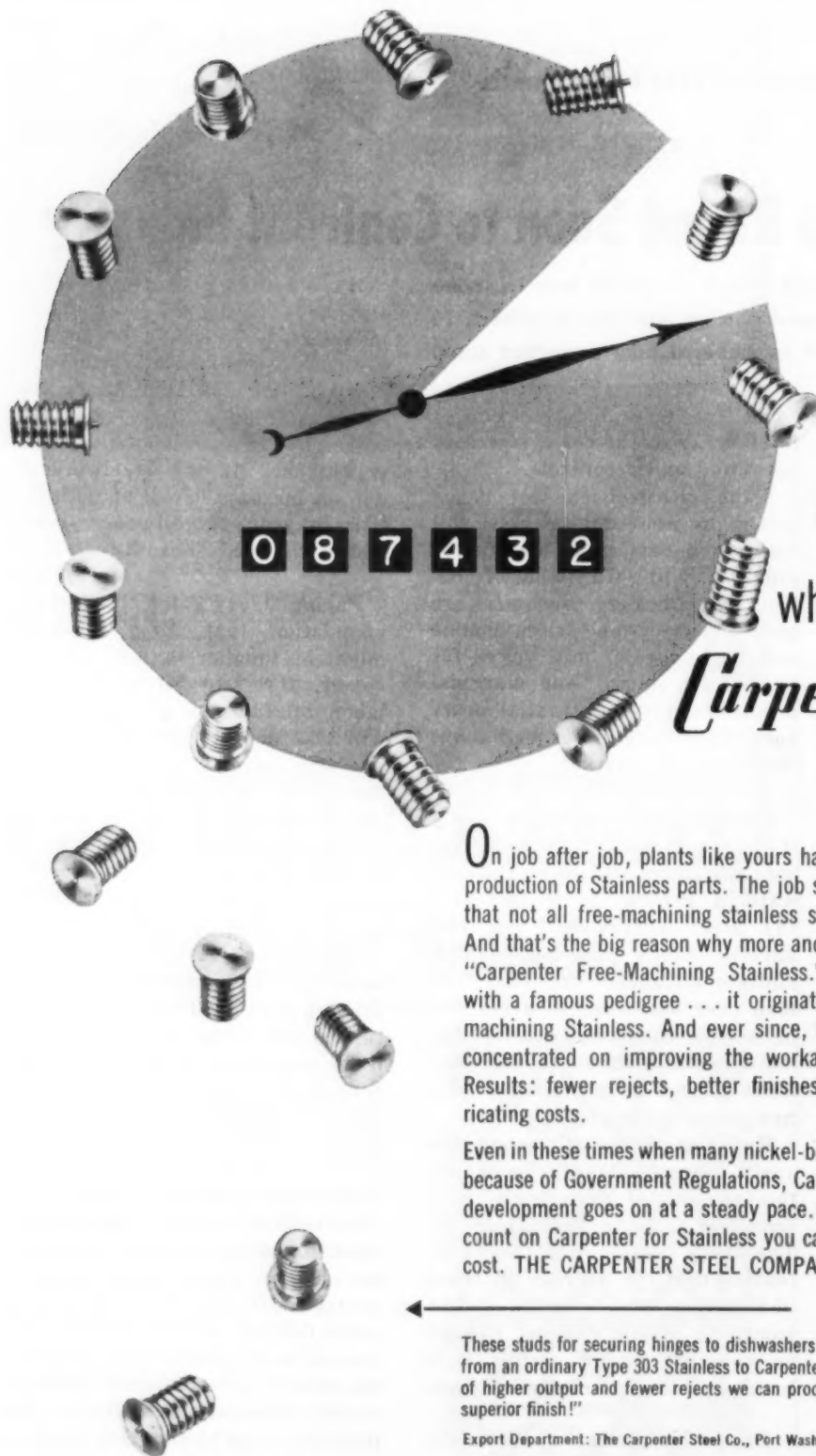
It's a foregone conclusion that David J. McDonald, new USW president, will demand a wage increase. He is expected to drive a hard bargain—even to the point of threatening a strike. But the betting is for a settlement without a walkout. If the steelworkers win an increase it will be nothing like last year's record concessions, which averaged 25¢ an hr.

Paying Heavy Price . . . Despite speculation that Mr. McDonald might be tougher than his predecessor, the late Philip Murray, labor relations people doubt he will risk another strike of workers who haven't fully recovered financially from last year's walkout. Average pay loss per worker in the 1952 strike was estimated by THE IRON AGE at \$650. On the basis of a 40-hr week their losses won't be made up until next fall.

This week, steel demand is as persistent and powerful as ever. Though high level production continues, and mills are becoming a little more current on deliveries, consumers are still applying plenty of pressure for all tonnage items.

Incentive to Buy . . . The near-term outlook is that this market condition will continue. Consumers might apply even greater pressure (if that is possible) for quick delivery as they become impressed with possibilities of price increases. In the next several weeks, procurement may be pressed on the theory that steel is better than money in the bank.

Ingot Rate Up . . . Steelmaking operations this week are scheduled at 99.0 pct of rated capacity, up 1 point from last week's revised rate. Achievement of scheduled operations this week would mean another new record for steel produced in a single week.



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Market Briefs and Bulletins

Wants Sheet Buyers . . . A midwestern conversion broker reports he has 2000 tons of prime galvanized sheets but hasn't been able to find any buyers. Mill demand for galvanized is still strong, but consumers aren't desperate enough to pay premium prices. One midwestern warehouse is shipping wrought iron pipe 2 to 10-in. diam within the 45-day lead time on rated orders. Pipe in this size range has been extremely tight for some time, so the improved delivery rate may indicate warehouse inventories are becoming better balanced.

Auto Production . . . According to auto production schedules about 3 million passenger cars will be produced by the end of June. If this output proves too much for the market, production cutbacks may be made and a rapid easing in steel demand would result. However, most automakers expect market to remain firm.

Inland Strike Toll . . . Wildcat strike at Inland Steel's Indiana Harbor plant, settled Feb. 3, resulted in a steel loss of more than 70,000 net ingot tons. The strike started at midnight, Jan. 29, when three workers were suspended for refusing to work overtime.

Heavy Press Program . . . Magnethermic Corp., Youngstown, Ohio, plans to enlarge its manufacturing facilities in order to build billet heaters for the Air Force's heavy press program. The company will furnish heaters for 8,000, 12,000 and 20,000-ton extrusion presses.

Build Altitude Lab . . . Naval Bureau of Aeronautics has awarded Thompson Products, Cleveland, contract to build a \$1.25 million high-altitude lab for testing aircraft pumps and turbine drive assemblies.

New Scrap Market . . . New can shredding plant in Houston is nearing completion. To be operated by City Junk & Supply Co., scrap from the plant will be used to precipitate cement copper at mines in Arizona, Utah and Montana. It is estimated that copper produced by the precipitation method (described in THE IRON AGE, Aug. 28, 1952, p. 39) will amount to 10 pct of total U. S. domestic supply.

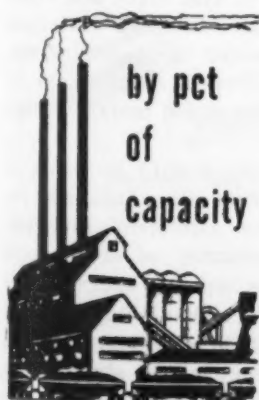
New Steel Plant . . . A new steel plant in Colombia, 200 miles north of Bogota will be in operation by January 1954. The completely integrated plant is expected to produce at a rate of 200,000 net tons per year. Output from the Empresa Siderurgia Nacional Paz De Rio plant will consist of small bars, rails and shapes, including certain wire products.

Close Ore Mine . . . After 65 years' operation, Tennessee Coal & Iron Div. of U. S. Steel Corp. has closed its nearly worked out Muscoda No. 4 iron ore mine near Birmingham, Ala.

Sell Company . . . Sale of Doehler-Jarvis Corp. to National Lead Co. was completed last week. (THE IRON AGE, Feb. 5, 1953, p. 100). Doehler-Jarvis shareholders will receive 1.15 shares of National Lead common stock for each share of stock in Doehler-Jarvis Corp., which will now be operated as a unit of National Lead.

Approve Power Contract . . . U. S. Dept. of Interior has approved a 20-year power contract between Harvey Machine Co., Los Angeles, and the Bonneville Power Administration for operation of an aluminum plant Harvey plans to build near The Dalles, Ore.

STEEL OPERATIONS

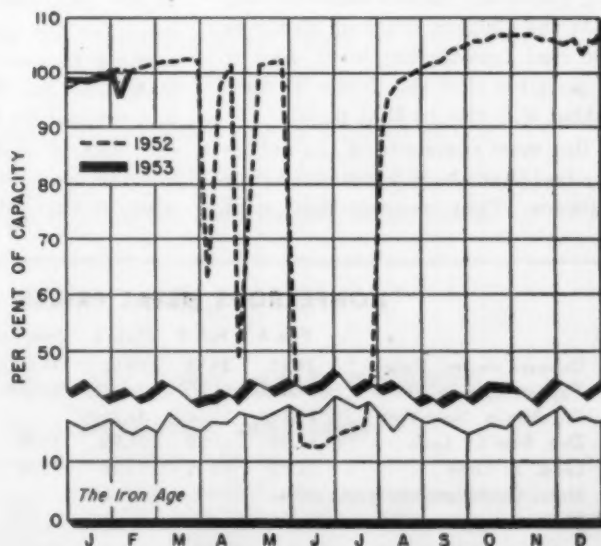


District Operating Rates

District	Week of Feb. 8	Week of Feb. 1
Pittsburgh	106.0	106.0*
Chicago	101.0	92.5*
Philadelphia	97.0	96.5
Valley	102.0	102.0
West	104.5	105.5*
Cleveland	96.0	96.5*
Buffalo	94.0	94.0
Detroit	104.0	101.0*
Birmingham		
(South)	97.5	98.5
Wheeling	101.0	101.0
South Ohio River	90.0	93.5
St. Louis	93.5	105.5
East	91.0	82.0*
Aggregate	99.0	98.0*

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

* Revised



Copper Prices Set for Increase

Generally, there won't be any radical changes in metals prices—except for copper . . . Final level may be about 30¢ per lb. . . . Brass will follow—By R. L. Hatschek.

While it is generally felt that there will be no overall price rise following the complete removal of ceilings, this is not true of copper. Copper will probably be the only major metal to be increased all across the board.

The present price ceiling of 24.50¢ per lb is only an arbitrary point and is exceeded or subsidized in many cases of marginal producers. Fact is that only about 50 pct of the copper purchased today is priced at that level, the remainder being either at a higher ceiling or imported at 36.50¢, delivered.

Boost Justified . . . Such a situation is deplorable—and has come in for strong criticism from many sources. But Office of Price Stabilization refused to move any farther than to indicate the ceiling might be increased by 3¢. With controls out the window now, supply and demand will determine the market price once again.

Where will it settle? That's the big question. There's some feeling that the Chilean price of 36.50¢ is the real free-market level. And it is possible that the domestic quotation will rise to that point.

But most segments of the industry feel that about 30¢ would bring balance. They reason that with

supply and demand operating Chile would also have to obey this natural law. It is possible that prices will first rise above the 30¢ mark, perhaps to the Chilean quotation, and then slip back to about 30¢ per lb.

Brass Going Up . . . Copper and brass mill products, now priced on a basis of 60 pct domestic copper and 40 pct foreign high-priced copper, must also be increased. The very fact that the arbitrary 60-40 ratio was not precisely adhered to cost the mills money. But since the foreign quotation was included at least partially in their ceilings, brass mill prices won't increase as much as raw copper.

One of the brightest aspects of the decontrol action, which will probably be one of the last made, is that higher prices will bring out a lot of copper scrap that just isn't to be had at present levels.

Zinc Output . . . Domestic production of slab zinc in January totaled 81,994 tons, almost the same as the total for the previous month, according to statistics of the American Zinc Institute. The institute has revised its 1952 total 230 tons upwards to a 12-month figure of 961,430 tons. Stocks at the beginning of this month had edged up

about 1000 tons to 88,475 and unfilled orders dipped to 39,732, a drop of some 4500 tons.

Meanwhile, the market for zinc remains steady at 11.50¢ per lb, f. o. b. East St. Louis, lowest point since the beginning of the war in Korea. Sellers reported demand light even at this price.

Wheland Site? . . . It's been reported that a Tennessee Valley Authority power contract is set to provide juice for the Wheland Co.'s aluminum smelter (see THE IRON AGE, Feb. 5, p. 194). Now reports have it that the company, the seventh in the rapidly growing aluminum industry, has acquired a site at South Pittsburgh, Tenn., just across the state line from Bridgeport, Ala.

Olin Industries, Inc., number five in order of entry to the industry has also looked over several sites in northern Alabama and elsewhere in the TVA area as well as West Virginia. This poses the question: Where would TVA get the power to support a 50,000-ton and a 110,000-ton aluminum reduction plant? Modern smelters require about 9 kwhr to reduce a pound of aluminum. TVA is increasing capacity as rapidly as possible but so far most of the power authorized is reported to have already been applied for and these two smelters ought to be ready for production by the end of 1954 if schedules are met.

Imports Okayed . . . Additional allotments of pig, ingot and other aluminum production materials will be granted to controlled material producers if supplies can be found on any world market except Canada.

Application should be made to National Production Authority requesting an allotment increase. Quantity, country of origin, and name of the importer should be included. NPA officials say there is metal available in Western Europe and the agency will be glad to okay such applications.

NONFERROUS METAL PRICES

	Feb. 4	Feb. 5	Feb. 6	Feb. 7	Feb. 9	Feb. 10
Copper, electro, Conn. . . .	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered . . .	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York . . .	\$1.21½	\$1.21½	\$1.21½	\$1.21½	\$1.21½*
Zinc, East St. Louis	11.50	11.50	11.50	11.50	11.50	11.50
Lead, St. Louis	13.30	13.30	13.30	13.30	13.30	13.30

Note: Quotations are going prices.

*Tentative.



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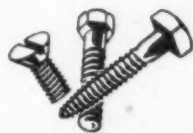
COPPER NAILS
and TACKS



COPPER
STORM NAILS



BRASS and BRONZE
BOLTS and NUTS



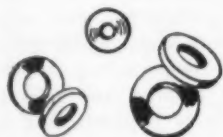
BRASS and BRONZE CAP,
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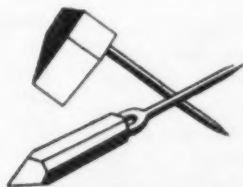
BRASS COTTER PINS
BRASS ESCUTCHEON PINS



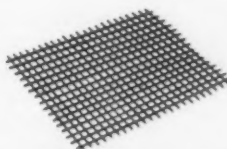
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Some Loopholes in OPS-Based Contracts

There's some concern about renegotiation of contracts based on OPS grades and ceilings . . . Pittsburgh reports "escape clauses" . . . Inspections tough, blast furnace grades slip.

Scrap men have more on their minds than the up and down rearrangement of prices when price controls end. Some are now worrying about possible renegotiation of contracts based on OPS grades and ceilings. From Pittsburgh comes the report that at least two district mills have included a clause in their contracts specifying that if ceiling prices go before orders are completed the remaining tonnage may be cancelled.

Signs of weakness for some grades are more apparent this week. Inspections in several centers were very rigid. Philadelphia dealers mourned the increasing rejection rate. Other cities were in similar circumstances. Blast furnace grades were in trouble in a few areas.

There was also some concern about the transition to a free market and its straight delivered mill basis. For some outlying shippers this question was in balance.

Pittsburgh — Will lifting of price controls automatically nullify scrap contracts based on OPS grades and ceilings? Some sources believe the contracts will be subject to renegotiation when controls are removed. But at least two district mills have been playing it safe since last December by including a clause specifying that if ceiling prices are killed before orders are completed remaining tonnage may be cancelled. Consensus here is that secondary openhearth grades may show a drop in price but prime material is likely to remain firm.

Chicago — The market was again less hopeful this week, with the possible exception of malleable. Blast furnace was going begging, and purchasing agents were beginning to eye No. 2 bundles and No. 2 heavy melting hopefully. Electric furnace continued

to hold with scattered exceptions. Market was thrown off slightly in cast by scattered ceiling sales but these were in small quantity. Sellers of turnings were not counting on any strength in the near future, and a break was a very good possibility.

Philadelphia — Dealers are wailing the blues more than ever this week over the increasing rate of rejections. Prices are still the same but consumers are demanding the best quality and some even refuse to take oversize material they accepted a short time ago. Yard intake is on the upswing as a result of good weather but dealers aren't too anxious.

New York — Overall movement of scrap is considered just fair. Good steelmaking scrap remains in good demand. Blast furnace grades are holding at ceiling but could see a slip in price when price controls fall. Inspection is very strict. Cast of course remains sloppy. The trade here is wondering what will happen with end of controls when prices make a transition to a delivered mill basis.

Detroit — Sagging blast furnace grades continued to pile up in Detroit yards with scarcely any sales reported at even below ceiling prices. Consensus is that anyone offering \$3 below ceiling could buy a big tonnage in a hurry. Trouble is, no one is offering anything. Machine shop turnings are going at ceiling but some in the trade are offering to buy short turnings at machine shop prices.

Cleveland — Buying in Cleveland and valley areas is selective. Dealers and brokers speculating about the effect of decontrol think return to straight delivered basis will necessitate some pricing adjustments. They believe openhearth prices will go up within basing point areas while dropping in outlying districts. If shift takes place, those who shoulder heaviest freight rate could be caught short.

Birmingham — Movement of steel scrap to northern mills from this area picked up this week. Some brokers said the reason might be that mills expected removal of ceilings shortly, with a possible price increase. Others, however, maintain that abolishing of ceilings actually may result in lower prices to dealers, for mills might base their buying prices on delivery at the mills, which would force shippers to assume at least a part of the freight cost.

Cincinnati — Most consumers here are still in a very comfortable position and have adopted a "wait and see" attitude about decontrol. Rail specialties remain tight. Foundries well stocked with cast and pig iron just aren't doing any buying. Lag has hit cast market to such an extent that some dealers say it would be hard to move with a \$5 reduction.

St. Louis — A sharp advance in re-rolling rails which have been scarce for some time, and a few railroad specialties is expected when ceilings are lifted from scrap. Some cast iron grades have been selling below the ceilings for months and sales have been few. It is believed that scrap will be one of the last items decontrolled.

Boston — Trading in steel grades of scrap is quieter in New England this week, though no prices have slipped below ceiling. The softness that started cast prices down a few weeks ago is continuing and these grades dropped another \$1 this week.

Buffalo — Only minor price adjustments are expected in scrap market if government controls are lifted at this time. Some of top quality grades such as No. 1 heavy melting and No. 1 bundles might sell slightly higher. Meanwhile steelmaking grades hold firm at ceiling levels.

West Coast — Dealers generally felt that the Oakland scrap firm which shipped 7000 tons of No. 2 bundles to eastern Canada was lucky to get rid of them. Lower prices last week failed to perk up mill buying and some hard-pressed dealers believe prices may drop some more. No price changes last week. Except for No. 1 cupola cast remained unmoveable at any price.